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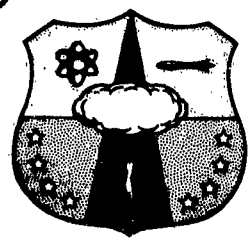

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Vol II

ABSTRACT

The effect of the coherent Doppler shift on the change in radiative flux per unit temperature gradient for the optically thick limit is considered. The solutions of nongrey Milne problems are also presented. Screening constants for the two-electron case are tabulated.

PUBLICATION REVIEW

This report has been reviewed and is approved.

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CONTENTS

Appendix B

COHERENT DOPPLER SHIFT

The problem considered in this Appendix is as follows: In an expanding (or contracting) medium, photons emitted at one point and absorbed at another experience a Doppler frequency shift due to the relative velocity of material at the two points, with the result that in the course of its flight a given photon "samples" the absorption coefficient of the material at frequencies other than the original photon frequency. Thus, for example, a photon emitted at a "window" frequency (between absorption lines) finds itself, after traveling some distance, no longer in a "window" but in an absorption line, and conversely. Accordingly, this coherent Doppler shift (so called to distinguish it from the shift produced by random thermal velocities) tends to decrease the probability of very long (window) and very short (line-center) photon flights, and so affects the rate of radiative energy transfer in the medium. Here, we consider only the optically-thick limit, and obtain an estimate for the change in radiative flux per unit temperature gradient. This turns out to be a decrease, at least for the models we have examined.

Consider an optically-thick plane-parallel medium with a small temperature gradient. The radiative flux (net energy per second crossing a unit area which is normal to the temperature gradient) can be evaluated from the angular intensity, which in turn is evaluated from the temperature distribution. Let x = distance measured parallel to the temperature gradient, from the plane x = 0 at which the flux is to be evaluated, and let μ = direction cosine with respect to the negative of the gradient. Then, assuming local thermodynamic equilibrium, no scattering, and negligible photon flight time, we have for <u>any</u> temperature distribution T(x):

$$\frac{|\text{Flux}|}{4\pi} = H = \int_0^\infty H_\nu \, d\nu,$$

$$H_\nu = \frac{1}{2} \int_{-1}^{+1} I_\nu(\mu) \, \mu \, d\mu,$$

$$I_\nu(\mu) = \int_0^\infty \exp\left[-\tau_\nu(s, \mu)\right] \cdot B_\nu\left[T(\mu s)\right] \left|\frac{\partial \tau_\nu}{\partial s}\right| ds,$$

where the last equation expresses $I_\nu(\mu)$ as a weighted average of $B_\nu(T)$

over the possible birthplaces of a photon which arrives at x = 0 traveling in the μ-direction; $B_\nu[T(x)]$ = Planck function characteristic of the temperature at position x. The quantity $\tau_\nu(s,\mu)$ is the number of mean free paths, for photons of frequency ν, between the origin and a point s units of length distant in the reversed μ-direction.

When the temperature gradient is small, we may expand T(x) about x = 0 and keep only the first nonvanishing contribution to H_ν. The result is

$$H_\nu = \frac{dT}{dx}\frac{\partial B_\nu}{\partial T}\frac{1}{2}\int_{-1}^{+1} d\mu\ \mu^2 \int_0^\infty \exp\left[-\tau_\nu(s,\mu)\right]\frac{\partial \tau_\nu}{\partial s}\, s\, ds\ .$$

Ordinarily, $\tau_\nu(s,\mu)$ is independent of μ and equal to s/Λ_ν, where Λ_ν is the mean free path at x = 0 for photons of frequency ν; the integral over s is then just Λ_ν, and the usual diffusion approximation emerges:

$$H_\nu = \frac{1}{3}\Lambda_\nu \frac{\partial B_\nu}{\partial T}\frac{dT}{dx}\ ,$$

$$H = \frac{1}{3}\Lambda_R \frac{dB}{dx}\ ,$$

where Λ_R is the Rosseland mean free path and $B = \int_0^\infty B_\nu\, d\nu$.

We now introduce a velocity gradient ∇V parallel to the temperature gradient, and evaluate H_ν again, taking into account the Doppler shift of the photon frequencies. We will consider only velocity gradients which are small compared with reciprocal photon flight times, so that the fractional frequency shift is small, but will permit an arbitrary ratio of line-spacing to frequency shift. A photon to which an observer fixed at the origin ascribes frequency ν interacts with matter at the point (s, μ) according to a different frequency, given by $\nu + s\mu^2\,\nu\,\nabla V/c$; the coefficient of ν/c in this expression is the speed with which the matter at (s, μ) is receding from the origin. Accordingly, we obtain

$$\tau_\nu(s,\mu) = \int_0^s \frac{dt}{\Lambda_{\nu+t\mu^2 Q}}\ ;\ Q = \nu\,\nabla V/c\ .$$

This is no longer independent of μ and simply proportional to s, because Λ_ν may vary rapidly with frequency. After an integration by parts, we obtain an expression for the ratio of monochromatic fluxes (at frequency ν) with and without Doppler shift:

$$\frac{H_\nu(Q)}{H_\nu(0)} = \frac{3}{\Lambda_\nu}\int_0^1 d\mu\ \mu^2 \int_0^\infty ds\ \exp\left[-\int_0^s \frac{dt}{\Lambda_{\nu+t\mu^2 Q}}\right].$$

This ratio can be either greater or less than unity, depending on how Λ_ν behaves at frequencies near ν. The frequency-averaged flux, however, is reduced by the Doppler shift. If we average H_ν over a frequency range covering several lines but small enough that $\partial B_\nu/\partial T$ is effectively constant, and call the result $\langle H \rangle$, we have for the "radiative efficiency"

$$e_R = \frac{\langle H(Q) \rangle}{\langle H(0) \rangle} = \frac{3}{\langle \Lambda \rangle} \int_0^1 d\mu\, \mu^2 \int_0^\infty ds \left\langle \exp\left[- \int_0^s dt / \Lambda_{\nu + t\mu^2 Q} \right] \right\rangle .$$

Here $\langle \Lambda \rangle$ is the locally-averaged Rosseland mean free path. If instead of a one-dimensional velocity gradient we had introduced an isotropic expansion with the same characteristic time, we would have gotten the same expression for e_R, except that the coefficient of tQ would be unity instead of μ^2, permitting immediate integration over μ.

This formal expression for e_R would be very cumbersome to use for an actual mean free path which varies rapidly with frequency; limiting cases and simple models, however, are illuminating. We see that for sufficiently large Q, e_R approaches the ratio of local Planck to local Rosseland mean free path, which is often a very small number. For such a case the total energy flux (integrated over frequency) would be given in terms of an "opacity" formed by using the local Planck mean free path averaged with the Rosseland weighting function.

The "efficiency" e_R can be evaluated for some simple models of the frequency-dependent mean free path. If the absorption coefficient consists entirely of uniformly-spaced identical Lorentz profiles (Elsasser's model*), one obtains

$$e_R = 3 \int_0^1 d\mu\, \mu^2 \tanh \beta \left[1 + 2 \sum_{n=1}^{\infty} \frac{\exp(-2n\beta)}{1 + (2\pi N \mu^a \tanh \beta)^2} \right],$$

where $\beta = 2\pi \cdot$ halfwidth/spacing; $\tanh \beta = \Lambda_P / \Lambda_R$; and $N = Q \Lambda_R /$ spacing. When β is small ($\Lambda_P \ll \Lambda_R$), there are three distinct regimes of N:

$$e_R \approx \left(1 + \frac{2N}{a+1} \right)^{-1} + \tanh \beta$$

where a = 2 for one-dimensional expansion, a = 0 for isotropic expansion. The angular distribution of the intensity is markedly different in the two

*W. M. Elsasser, Phys. Rev., 54, 126 (1938).

cases, since long photon flights in directions near $\mu = 0$ are possible in the one-dimensional expansion.

Models in which delta-function lines are superposed on a continuous background, with either uniform or random spacing, can also be treated; the results are very similar to those for the Elsasser model with small β. In all cases examined, the important parameter (besides the Planck to Rosseland ratio) is N, the Doppler shift per Rosseland mean free path in units of the average line spacing. This suggests that the effect of coherent Doppler shift (in the optically-thick problem we have considered) is somewhat like the effect of "folding" into each line in the spectrum a square broadening function, with the widths of these chosen in such a way that (for $N \gg 1$) about $1/N$ of the windows between lines are not filled in.

Appendix C

NONGREY MILNE PROBLEMS[1]

In its radiative-transfer context, the Milne problem may be stated as follows: A semi-infinite plane-parallel medium, bounded on one side by a vacuum, is in local thermodynamic equilibrium and transfers energy only by radiation; a constant net flux of energy passes outward through the medium into the vacuum. Find the steady-state temperature distribution in the medium and the angular intensity distribution in the vacuum.

For the most general dependence of the photon mean free path on temperature, density, and frequency, the above conditions have to be supplemented by a hydrostatic-equilibrium condition or some other relation which determines the density distribution. When the mean free path is separable into a function of frequency times a function of temperature and density, the hydrostatic problem splits off and one has the "Milne-Eddington model." If, further, the statistical distribution of mean free paths is the same at all frequencies, one refers to the "uniform line-blanketing model"; finally, if the mean free path is independent of frequency altogether, it is the "grey model."

In all of the above cases, the "source function" (fourth power of temperature) is asymptotically linear in the Rosseland optical depth. We confine our attention, in what follows, to the uniform line-blanketing model (which includes the grey model as a special case), for which each problem is defined by the probability distribution of mean free paths; the local Rosseland-to-Planck mean free path ratio is then a constant of the problem, larger than unity for any case except the grey one.

The source function may be written as $T + X(T)$, times a normalizing constant. Here, T is the Planck optical depth. The angular intensity distribution in the vacuum, for this model, is a function of one variable Z, which we may take as μ (= direction cosine with respect to the outward normal to the surface) times L (= mean free path in units of longest mean free path). Let $H(Z)$ be the specific intensity in direction μ, integrated over those frequencies where the mean free path is L times the longest, in units of the same quantity for $\mu = 0+$. ($\mu = 0+$ corresponds to grazing emergence from the surface.) The function $H(Z)$ is sometimes called the limb darkening, and is expressible in terms of the Laplace transform of the source function. Both $X(T)$ and $H(Z)$ depend on the probability distribution $P(L)$.

The grey case, $P(L) = \delta(L - 1)$, has been solved exactly and by many approximate methods.[2] The exact $X(0)$[3] and several approximate solutions[4,5] have been published for various nongrey cases. One approximate method, that of "discrete ordinates,"[5,7] becomes exact in the limit of infinite order of approximation, but then involves finding

the roots of an algebraic equation of infinite degree. We have found a way to remove this difficulty by spacing the poles of the equation (which can be freely chosen in the method) uniformly along the real axis; this permits the roots to be obtained from an approximating function which becomes exact in the limit of an infinite number of poles and roots. Thus, the exact solution for arbitrary P(L) has been obtained. The results are as follows:

$$C(Y) = \int_Y^1 dL\ P(L)/L^2 \quad ,$$

$$F(Y) = \frac{1}{C(Y)} \int_0^1 dL\ \frac{P(L)}{L^2} \left[\ln \left| \frac{L+Y}{L-Y} \right| - \frac{2L}{Y} \right] \quad ,$$

$$F(Y) = \pi \cot \pi G(Y) \quad , \qquad 0 < G < 1 \quad ,$$

$$H(Z) = (1+Z) \exp \int_0^1 dY \left[\frac{1}{Y} - \frac{1}{Z+Y} \right] \cdot \left[1 - G(Y) \right] ,$$

$$W(Z) = 2\sqrt{\frac{\langle L \rangle \langle L^{-1} \rangle}{3}} \cdot \frac{1}{Z^2\, C(Z)\, H(Z)\, [\pi^2 + F^2(Z)]} \quad ,$$

$$Q = \langle L^{-1} \rangle \int_0^1 G(Y)\, dY \quad ,$$

$$X(T) = Q - \langle L^{-1} \rangle \int_0^1 dZ\ W(Z) \exp \left(- T/Z \langle L^{-1} \rangle \right) \quad ,$$

where $\langle\ \rangle$ means an average with respect to P(L). Thus, $\langle L \rangle \cdot \langle L^{-1} \rangle$ is the Rosseland-to-Planck mean free path ratio.

Three additional relations which emerge from the theory purport to be identities for any P(L). They are

$$R \equiv \int_0^1 dY\,[1 - G(Y)]/Y = \frac{1}{2} \ln\,(3\langle L^{-1}\rangle/\langle L\rangle) \equiv R1 \quad ,$$

$$S \equiv \int_0^1 dY\; Y\, G(Y) = \frac{3}{10}\,\langle L^3\rangle/\langle L\rangle \equiv S1 \quad ,$$

$$X(0) = \sqrt{\langle L\rangle\langle L^{-1}\rangle/3} \equiv P \quad .$$

The last of these (in which P is not to be confused with P(L)) is Hopf's relation for the surface temperature.[3] All three can serve as self-consistency checks for a numerical calculation.

In Appendix D we present numerical results for a family of "picket-fence" cases, $P(L) = [\delta(L - 1) + CD^2\,\delta\,(L - D)]/(1 + CD^2)$, which were treated approximately by King.[5] The constants C and D are chosen so that the quantities LAM 1 = $\langle L\rangle\langle L^{-1}\rangle$ and LAM 2 = $\langle L^2\rangle\langle L^{-1}\rangle^2$ are the same as for an Elsasser * model with $2\pi \cdot$ (line halfwidth)/(line spacing) = β. The quantity LAMDA is $\langle L^{-1}\rangle$, the longer mfp/Planck mfp. The grey case ($\beta = \infty$) is included as a check; comparison with the published exact solution[2] shows errors confined to the eighth decimal place in H(Z) and the fifth in X(T). For the other cases, the close agreement of R with R_1, S with S_1, and P with X(0) is indicative of similar accuracy.

One important parameter of the temperature distribution is the extrapolation length (in units of the Planck mean free path) Q, which is the limiting value of X(T) for large T, so that the asymptotic part of the source function extrapolates to zero a distance Q Planck mean free paths outside the surface of the medium. The related quantities Q/LAM 1 and Q/LAMDA are the extrapolation length in units of the Rosseland and longest mean free paths, respectively. We find that the former is always larger, and the latter always smaller, than the value 0.710446 (which is Q for the grey case); this exhibits one effect of line absorption on the temperature distribution.

A much more pronounced effect is the behavior of X(T) near the surface. This is best perceived by plotting [T + X(T)]/LAM 1 against T/LAM 1 for various β; the resulting family of curves would represent the source function versus Rosseland optical depth, normalized so that all models have the same net flux of radiation. With decreasing β (increasing "nongreyness"), the surface temperature sinks in accordance with Hopf's relation, and the source function becomes steeper near the surface. This is the "blanketing effect of line absorption" of the astrophysical literature. A practical consequence is that the presence of the cool surface layer can influence the observed spectrum of a stellar or terrestrial plasma appreciably.

*W. M. Elsasser, Phys. Rev., 54, 126 (1938).

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Appendix D

SOLUTIONS OF NONGREY MILNE PROBLEMS

$\beta = .1$

Z	H(Z)	Z	H(Z)	Z	H(Z)
0.	1.0000000+00	0.0360	2.6562423+00	0.3600	7.3648285+00
0.00005	1.0078371+00	0.0380	2.7176333+00	0.3800	7.5676502+00
0.00010	1.0143255+00	0.0400	2.7774493+00	0.4000	7.7677990+00
0.00015	1.0203204+00	0.0420	2.8357817+00	0.4200	7.9655717+00
0.0002	1.0260004+00	0.0440	2.8927135+00	0.4400	8.1612219+00
0.0003	1.0367201+00	0.0460	2.9483217+00	0.4600	8.3549662+00
0.0004	1.0468367+00	0.0480	3.0026766+00	0.4800	8.5469028+00
0.0005	1.0565148+00	0.0500	3.0558435+00	0.5000	8.7374644+00
0.0006	1.0658500+00	0.0550	3.1839501+00	0.5200	8.9265237+00
0.0007	1.0749051+00	0.0600	3.3058315+00	0.5400	9.1142960+00
0.0008	1.0837238+00	0.0650	3.4221886+00	0.5600	9.3008907+00
0.0010	1.1007748+00	0.0700	3.5336144+00	0.5800	9.4864064+00
0.0012	1.1171858+00	0.0750	3.6406166+00	0.6000	9.6709290+00
0.0014	1.1330748+00	0.0800	3.7436324+00	0.6200	9.8545365+00
0.0016	1.1485248+00	0.0850	3.8430412+00	0.6400	1.0037298+01
0.0018	1.1635966+00	0.0900	3.9391732+00	0.6600	1.0219277+01
0.0020	1.1783365+00	0.0950	4.0323187+00	0.6800	1.0400528+01
0.0025	1.2139581+00	0.1000	4.1227332+00	0.7000	1.0581102+01
0.0030	1.2481261+00	0.1050	4.2106431+00	0.7500	1.1029870+01
0.0035	1.2811057+00	0.1100	4.2962492+00	0.8000	1.1475300+01
0.0040	1.3130788+00	0.1150	4.3797308+00	0.8500	1.1917882+01
0.0045	1.3441780+00	0.1200	4.4612487+00	0.9000	1.2358012+01
0.0050	1.3745050+00	0.1250	4.5409470+00	0.9500	1.2796015+01
0.0055	1.4041386+00	0.1300	4.6189556+00	1.0000	1.3232159+01
0.0060	1.4331426+00	0.1350	4.6953925+00	C	D
0.0065	1.4615693+00	0.1400	4.7703637+00	0.93146823+03	0.23919303-01
0.0070	1.4894624+00	0.1450	4.8439665+00	LAM1	LAM2
0.0075	1.5168584+00	0.1500	4.9162884+00	0.10033309+02	0.15050097+03
0.0080	1.5437899+00	0.1600	5.0574061+00	Q/LAM1	R
0.0085	1.5702841+00	0.1700	5.1962828+00	0.99147788+00	0.21167726+01
0.0090	1.5963652+00	0.1800	5.3273970+00	LAMDA	D*LAMDA
0.0095	1.6220545+00	0.1900	5.4571552+00	0.15186711+02	0.36325555-00
0.0100	1.6473711+00	0.2000	5.5839055+00	LAM3	R1
0.0120	1.7452300+00	0.2100	5.7079480+00	0.22849347+04	0.21167716+01
0.0140	1.8382476+00	0.2200	5.8295434+00	S	P
0.0160	1.9270544+00	0.2300	5.9489182+00	0.29622564-00	0.18287800+01
0.0180	2.0121297+00	0.2400	6.0662716+00	L1	L2
0.0200	2.0938532+00	0.2500	6.1817781+00	0.66066375+00	0.65254705+00
0.0220	2.1725364+00	0.2600	6.2955928+00	S1	Q
0.0240	2.2484405+00	0.2700	6.4078526+00	0.29622614-00	0.99478045+01
0.0260	2.3217893+00	0.2800	6.5186803+00	L3	Q/LAMDA
0.0280	2.3927764+00	0.2900	6.6281851+00	0.65235291+00	0.65503349+00
0.0300	2.4615720+00	0.3000	6.7364653+00		
0.0320	2.5283271+00	0.3200	6.9496961+00		
0.0340	2.5931769+00	0.3400	7.1589831+00		

$\beta = .1$

T	X(T)	T/LAM1	X(T)/LAM1
0.	1.8288193+00	0.	1.8227478-01
0.010	1.9576364+00	9.9668009-04	1.9511372-01
0.020	2.0564739+00	1.9933602-03	2.0496466-01
0.030	2.1450078+00	2.9900403-03	2.1378866-01
0.040	2.2271900+00	3.9867204-03	2.2197959-01
0.050	2.3048238+00	4.9834005-03	2.2971720-01
0.060	2.3789401+00	5.9800805-03	2.3710423-01
0.070	2.4502016+00	6.9767607-03	2.4420671-01
0.080	2.5190634+00	7.9734408-03	2.5107004-01
0.090	2.5858616+00	8.9701209-03	2.5772768-01
0.100	2.6508466+00	9.9668009-03	2.6420461-01
0.150	2.9543295+00	1.4950201-02	2.9445214-01
0.200	3.2309460+00	1.9933602-02	3.2202196-01
0.250	3.4875020+00	2.4917003-02	3.4759238-01
0.300	3.7277719+00	2.9900403-02	3.7153961-01
0.350	3.9541412+00	3.4883803-02	3.9410139-01
0.400	4.1682875+00	3.9867204-02	4.1544492-01
0.500	4.5645604+00	4.9834005-02	4.5494065-01
0.600	4.9237204+00	5.9800805-02	4.9073741-01
0.700	5.2507101+00	6.9767607-02	5.2332783-01
0.800	5.5492955+00	7.9734408-02	5.5308724-01
0.900	5.8225244+00	8.9701209-02	5.8031942-01
1.000	6.0729582+00	9.9668010-02	6.0527967-01
1.200	6.5140095+00	1.1960161-01	6.4923836-01
1.400	6.8871540+00	1.3953521-01	6.8642893-01
1.600	7.2040781+00	1.5946882-01	7.1801613-01
1.800	7.4742607+00	1.7940242-01	7.4494469-01
2.000	7.7054591+00	1.9933602-01	7.6798777-01
2.200	7.9040645+00	2.1926962-01	7.8778238-01
2.400	8.0753622+00	2.3920322-01	8.0485529-01
2.600	8.2237301+00	2.5913683-01	8.1964282-01
2.800	8.3528025+00	2.7907043-01	8.3250721-01
3.000	8.4656012+00	2.9900403-01	8.4374963-01
4.000	8.8603632+00	3.9867204-01	8.8309478-01
5.000	9.0920027+00	4.9834005-01	9.0618182-01
6.000	9.2445555+00	5.9800807-01	9.2138646-01
7.000	9.3546757+00	6.9767607-01	9.3236191-01
8.000	9.4394273+00	7.9734409-01	9.4080893-01
9.000	9.5074401+00	8.9701209-01	9.4758763-01
10.000	9.5635098+00	9.9668010-01	9.5317600-01

$\beta = .2$

Z	H(Z)
	1.0000000+00
0.00005	1.0038266+00
0.00010	1.0070379+00
0.00015	1.0100207+00
0.0002	1.0128572+00
0.0003	1.0182294+00
0.0004	1.0233156+00
0.0005	1.0281928+00
0.0006	1.0329050+00
0.0007	1.0374821+00
0.0008	1.0419441+00
0.0010	1.0505819+00
0.0012	1.0589053+00
0.0014	1.0669711+00
0.0016	1.0748194+00
0.0018	1.0824796+00
0.0020	1.0899746+00
0.0025	1.1080994+00
0.0030	1.1254994+00
0.0035	1.1423072+00
0.0040	1.1586157+00
0.0045	1.1744930+00
0.0050	1.1899913+00
0.0055	1.2051517+00
0.0060	1.2200075+00
0.0065	1.2345859+00
0.0070	1.2489100+00
0.0075	1.2629988+00
0.0080	1.2768692+00
0.0085	1.2905355+00
0.0090	1.3040103+00
0.0095	1.3173050+00
0.0100	1.3304292+00
0.0120	1.3813864+00
0.0140	1.4301905+00
0.0160	1.4771556+00
0.0180	1.5225135+00
0.0200	1.5664432+00
0.0220	1.6090868+00
0.0240	1.6505604+00
0.0260	1.6909614+00
0.0280	1.7303720+00
0.0300	1.7688629+00
0.0320	1.8064966+00
0.0340	1.8433273+00
0.0360	1.8794035+00
0.0380	1.9147690+00
0.0400	1.9494624+00
0.0420	1.9835198+00
0.0440	2.0169734+00
0.0460	2.0498530+00
0.0480	2.0821860+00
0.0500	2.1139976+00
0.0550	2.1913953+00
0.0600	2.2660003+00
0.0650	2.3380859+00
0.0700	2.4078864+00
0.0750	2.4756044+00
0.0800	2.5414163+00
0.0850	2.6054774+00
0.0900	2.6679247+00
0.0950	2.7288806+00
0.1000	2.7884541+00
0.1050	2.8467433+00
0.1100	2.9038362+00
0.1150	2.9598130+00
0.1200	3.0147459+00
0.1250	3.0687008+00
0.1300	3.1217381+00
0.1350	3.1739129+00
0.1400	3.2252756+00
0.1450	3.2758728+00
0.1500	3.3257473+00
0.1600	3.4234833+00
0.1700	3.5187660+00
0.1800	3.6118385+00
0.1900	3.7029116+00
0.2000	3.7921692+00
0.2100	3.8797722+00
0.2200	3.9658626+00
0.2300	4.0505658
0.2400	4.1339933
0.2500	4.2162448
0.2600	4.2974091
0.2700	4.3775661
0.2800	4.4567878
0.2900	4.5351393
0.3000	4.6126796
0.3200	4.7654991
0.3400	4.9156957
0.3600	5.0635448
0.3800	5.2093110
0.400	5.3532196
0.4200	5.4954634
0.4400	5.6362088
0.4600	5.7755999
0.4800	5.9137627
0.5000	6.0508074
0.5200	6.1868309
0.5400	6.3219193
0.5600	6.4561486+00
0.5800	6.5895870+00
0.6000	6.7222946+00
0.6200	6.8543271+00
0.6400	6.9857329+00
0.6600	7.1165564+00
0.6800	7.2468379
0.7000	7.3766137
0.7500	7.6990520
0.800	8.0189745
0.8500	8.3367399
0.9000	8.6526404
0.9500	8.9669166
1.0000	9.2797690

0.21651440+03	0.51078250-01
LAM1	LAM2
0.50664892+01	0.38003968+02
Q/LAM1	R
0.96317533+00	0.17799967+01
LAMDA	D*LAMDA
0.77061184+01	0.39361504-00
LAM3	R1
0.29245411+03	0.17799966+01
S	P
0.29160850-00	0.12995498+01
L1	LZ
0.65746321+00	0.63996702+00
S1	Q
0.29160871-00	0.48799174+01
L3	Q/LAMDA
0.63907335+00	0.63325234+00

$\beta = .2$

T	X(T)	T/LAM1	X(T)/LAM1
0.	1.2995595+00	0.	2.5650098-01
0.010	1.3768391+00	1.9737533-03	2.7175407-01
0.020	1.4349772+00	3.9475065-03	2.8322910-01
0.030	1.4864567+00	5.9212598-03	2.9338988-01
0.040	1.5338017+00	7.8950130-03	3.0273462-01
0.050	1.5781711+00	9.8687663-03	3.1149203-01
0.060	1.6202302+00	1.1842520-02	3.1979347-01
0.070	1.6604066+00	1.3816273-02	3.2772331-01
0.080	1.6989967+00	1.5790026-02	3.3534003-01
0.090	1.7362217+00	1.7763780-02	3.4268733-01
0.100	1.7722458+00	1.9737533-02	3.4979760-01
0.150	1.9381365+00	2.9606299-02	3.8254032-01
0.200	2.0862360+00	3.9475065-02	4.1177151-01
0.250	2.2211568+00	4.9343833-02	4.3840156-01
0.300	2.3455016+00	5.9212598-02	4.6294415-01
0.350	2.4609475+00	6.9081365-02	4.8573033-01
0.400	2.5686760+00	7.8950131-02	5.0699326-01
0.500	2.7643254+00	9.8687665-02	5.4560963-01
0.600	2.9375816+00	1.1842520-01	5.7980613-01
0.700	3.0919864+00	1.3816273-01	6.1028183-01
0.800	3.2302016+00	1.5790026-01	6.3756211-01
0.900	3.3543372+00	1.7763780-01	6.6206341-01
1.000	3.4661283+00	1.9737533-01	6.8412822-01
1.200	3.6582941+00	2.3685039-01	7.2205700-01
1.400	3.8160500+00	2.7632546-01	7.5319412-01
1.600	3.9464594+00	3.1580052-01	7.7893373-01
1.800	4.0549767+00	3.5527559-01	8.0035236-01
2.000	4.1458676+00	3.9475066-01	8.1829197-01
2.200	4.2224970+00	4.3422572-01	8.3341675-01
2.400	4.2875317+00	4.7370079-01	8.4625299-01
2.600	4.3430961+00	5.1317586-01	8.5722003-01
2.800	4.3908889+00	5.5265092-01	8.6665314-01
3.000	4.4322729+00	5.9212599-01	8.7482132-01
4.000	4.5749174+00	7.8950132-01	9.0297583-01
5.000	4.6575933+00	9.8687664-01	9.1929400-01
6.000	4.7113062+00	1.1842520+00	9.2989560-01
7.000	4.7489237+00	1.3816273+00	9.3732039-01
8.000	4.7765337+00	1.5790026+00	9.4276992-01
9.000	4.7974106+00	1.7763780+00	9.4689050-01
10.000	4.8135145+00	1.9737533+00	9.5006902-01

$\beta = .3$

Z	H(Z)	Z	H(Z)	Z	H(Z)
0.	1.0000000+00	0.0360	1.5966309+00	0.3600	4.0797281+00
0.00005	1.0024475+00	0.0380	1.6215713+00	0.3800	4.1989916+00
0.00010	1.0045193+00	0.0400	1.6461190+00	0.4000	4.3168634+00
0.00015	1.0064510+00	0.0420	1.6702952+00	0.4200	4.4334797+00
0.0002	1.0082925+00	0.0440	1.6941186+00	0.4400	4.5489589+00
0.0003	1.0117893+00	0.0460	1.7176069+00	0.4600	4.6634048+00
0.0004	1.0151092+00	0.0480	1.7407755+00	0.4800	4.7769085+00
0.0005	1.0182989+00	0.0500	1.7636392+00	0.5000	4.8895503+00
0.0006	1.0213856+00	0.0550	1.8195495+00	0.5200	5.0014014+00
0.0007	1.0243877+00	0.0600	1.8738192+00	0.5400	5.1125253+00
0.0008	1.0273179+00	0.0650	1.9266024+00	0.5600	5.2229786+00
0.0010	1.0329980+00	0.0700	1.9780309+00	0.5800	5.3328121+00
0.0012	1.0384800+00	0.0750	2.0282185+00	0.6000	5.4420711+00
0.0014	1.0437991+00	0.0800	2.0772636+00	0.6200	5.5507970+00
0.0016	1.0489804+00	0.0850	2.1252532+00	0.6400	5.6590271+00
0.0018	1.0540421+00	0.0900	2.1722642+00	0.6600	5.7667949+00
0.0020	1.0589989+00	0.0950	2.2183651+00	0.6800	5.8741312+00
0.0025	1.0710004+00	0.1000	2.2636173+00	0.7000	5.9810639+00
0.0030	1.0825392+00	0.1050	2.3080763+00	0.7500	6.2467925+00
0.0035	1.0936997+00	0.1100	2.3517919+00	0.8000	6.5104970+00
0.0040	1.1045409+00	0.1150	2.3948098+00	0.8500	6.7724572+00
0.0045	1.1151063+00	0.1200	2.4371712+00	0.9000	7.0329025+00
0.0050	1.1254297+00	0.1250	2.4789143+00	0.9500	7.2920231+00
0.0055	1.1355372+00	0.1300	2.5200737+00	1.0000	7.5499782+00
0.0060	1.1454508+00	0.1350	2.5606814+00	C	D
0.0065	1.1551878+00	0.1400	2.6007670+00	0.90376800+02	0.81186459-01
0.0070	1.1647632+00	0.1450	2.6403576+00	LAM1	LAM2
0.0075	1.1741894+00	0.1500	2.6794786+00	0.34327383+01	0.17175538+02
0.0080	1.1834776+00	0.1600	2.7564037+00	Q/LAM1	K
0.0085	1.1926370+00	0.1700	2.8317110+00	0.93868843+00	0.15860657+01
0.0090	1.2016757+00	0.1800	2.9055468+00	LAMDA	D*LAMDA
0.0095	1.2106013+00	0.1900	2.9780403+00	0.52249150+01	0.42419235-00
0.0100	1.2194200+00	0.2000	3.0493043+00	LAM3	R1
0.0120	1.2537342+00	0.2100	3.1194389+00	0.89418248+02	0.15860654+01
0.0140	1.2867141+00	0.2200	3.1885332+00	S	P
0.0160	1.3185647+00	0.2300	3.2566666+00	0.28625156-00	0.10696944+01
0.0180	1.3494366+00	0.2400	3.3239103+00	L1	L2
0.0200	1.3794452+00	0.2500	3.3903282+00	0.65699410+00	0.62914667+00
0.0220	1.4086364+00	0.2600	3.4559782+00	S1	Q
0.0240	1.4371741+00	0.2700	3.5209124+00	0.28625180-00	0.32222718+01
0.0260	1.4650746+00	0.2800	3.5851785+00	L3	Q/LAMDA
0.0280	1.4923893+00	0.2900	3.6488195+00	0.62688583+00	0.61671276+00
0.0300	1.5191619+00	0.3000	3.7118746+00		
0.0320	1.5454305+00	0.3200	3.8363690+00		
0.0340	1.5712749+00	0.3400	3.9589150+00		

$\beta = .3$

T	X(T)	T/LAM1	X(T)/LAM1
0.	1.0696986+00	0.	3.1161669-01
0.010	1.1246959+00	2.9131261-03	3.2763810-01
0.020	1.1654705+00	5.8262522-03	3.3951627-01
0.030	1.2012694+00	8.7393782-03	3.4994491-01
0.040	1.2339706+00	1.1652504-02	3.5947121-01
0.050	1.2644408+00	1.4565631-02	3.6834755-01
0.060	1.2931767+00	1.7478757-02	3.7671869-01
0.070	1.3205001+00	2.0391883-02	3.8467833-01
0.080	1.3466349+00	2.3305009-02	3.9229173-01
0.090	1.3717450+00	2.6218135-02	3.9960662-01
0.100	1.3959556+00	2.9131261-02	4.0665948-01
0.150	1.5063933+00	4.3696891-02	4.3883136-01
0.200	1.6036463+00	5.8262522-02	4.6716239-01
0.250	1.6912441+00	7.2828153-02	4.9268073-01
0.300	1.7711875+00	8.7393782-02	5.1596926-01
0.350	1.8447687+00	1.0195941-01	5.3740440-01
0.400	1.9128971+00	1.1652505-01	5.5725105-01
0.500	2.0353609+00	1.4565631-01	5.9292631-01
0.600	2.1424907+00	1.7478757-01	6.2413456-01
0.700	2.2369459+00	2.0391883-01	6.5165056-01
0.800	2.3206937+00	2.3305009-01	6.7604734-01
0.900	2.3952633+00	2.6218135-01	6.9777042-01
1.000	2.4618890+00	2.9131261-01	7.1717931-01
1.200	2.5752252+00	3.4957513-01	7.5019558-01
1.400	2.6671078+00	4.0783766-01	7.7696215-01
1.600	2.7422377+00	4.6610018-01	7.9884845-01
1.800	2.8041573+00	5.2436270-01	8.1688640-01
2.000	2.8555771+00	5.8262522-01	8.3186563-01
2.200	2.8985946+00	6.4088774-01	8.4439719-01
2.400	2.9348455+00	6.9915026-01	8.5495752-01
2.600	2.9656132+00	7.5741280-01	8.6392053-01
2.800	2.9919111+00	8.1567532-01	8.7158142-01
3.000	3.0145421+00	8.7393785-01	8.7817413-01
4.000	3.0911711+00	1.1652505+00	9.0049711-01
5.000	3.1338697+00	1.4565631+00	9.1293578-01
6.000	3.1602292+00	1.7478757+00	9.2061461-01
7.000	3.1776136+00	2.0391883+00	9.2567892-01
8.000	3.1895702+00	2.3305009+00	9.2916203-01
9.000	3.1980242+00	2.6218135+00	9.3162478-01
10.000	3.2041183+00	2.9131261+00	9.3340087-01

$\beta = .4$

Z	H(Z)	Z	H(Z)	Z	H(Z)
0	1.0000000+00	0.0340	1.4311776+00	0.3200	3.3046458+00
0.00005	1.0017618+00	0.0360	1.4507826+00	0.3400	3.4100456+00
0.00010	1.0032630+00	0.0380	1.4701057+00	0.3600	3.5141177+00
0.00015	1.0046669+00	0.0400	1.4891632+00	0.3800	3.6169952+00
0.0002	1.0060079+00	0.0420	1.5079694+00	0.4000	3.7187941+00
0.0003	1.0085599+00	0.0440	1.5265376+00	0.4200	3.8196146+00
0.0004	1.0109879+00	0.0460	1.5448797+00	0.4400	3.9195447+00
0.0005	1.0133249+00	0.0480	1.5630065+00	0.4600	4.0186620+00
0.0006	1.0155897+00	0.0500	1.5809281+00	0.4800	4.1170348+00
0.0007	1.0177949+00	0.0550	1.6248920+00	0.5000	4.2147239+00
0.0008	1.0199495+00	0.0600	1.6677527+00	0.5200	4.3117833+00
0.0010	1.0241313+00	0.0650	1.7096144+00	0.5400	4.4082614+00
0.0012	1.0281734+00	0.0700	1.7505646+00	0.5600	4.5042017+00
0.0014	1.0321003+00	0.0750	1.7906790+00	0.5800	4.5996432+00
0.0016	1.0359294+00	0.0800	1.8300228+00	0.6000	4.6946213+00
0.0018	1.0396738+00	0.0850	1.8686532+00	0.6200	4.7891677+00
0.0020	1.0433436+00	0.0900	1.9066205+00	0.6400	4.8833116+00
0.0025	1.0522404+00	0.0950	1.9439700+00	0.6600	4.9770795+00
0.0030	1.0608077+00	0.1000	1.9807416+00	0.6800	5.0704954+00
0.0035	1.0691050+00	0.1050	2.0169716+00	0.7000	5.1635813+00
0.0040	1.0771744+00	0.1100	2.0526927+00	0.7500	5.3949808+00
0.0045	1.0850469+00	0.1150	2.0879347+00	0.8000	5.6247132+00
0.0050	1.0927465+00	0.1200	2.1227246+00	0.8500	5.8530023+00
0.0055	1.1002919+00	0.1250	2.1570872+00	0.9000	6.0800321+00
0.0060	1.1076986+00	0.1300	2.1910453+00	0.9500	6.3059573+00
0.0065	1.1149793+00	0.1350	2.2246200+00	1.0000	6.5309070+00
0.0070	1.1221446+00	0.1400	2.2578306+00	C	D
0.0075	1.1292036+00	0.1450	2.2906951+00	0.48202089+02	0.11388894-00
0.0080	1.1361642+00	0.1500	2.3232301+00	LAM1	LAM2
0.0085	1.1430330+00	0.1600	2.3873727+00	0.26319326+01	0.98906033+01
0.0090	1.1498160+00	0.1700	2.4503700+00	Q/LAM1	R
0.0095	1.1565184+00	0.1800	2.5123202+00	0.91534517+00	0.14500213+01
0.0100	1.1631451+00	0.1900	2.5733090+00	LAMDA	D*LAMDA
0.0120	1.1889705+00	0.2000	2.6334130+00	0.39931255+01	0.45477307-00
0.0140	1.2138532+00	0.2100	2.6926995+00	LAM3	R1
0.0160	1.2379416+00	0.2200	2.7512293+00	0.39212901+02	0.14500211+01
0.0180	1.2613446+00	0.2300	2.8090565+00	S	P
0.0200	1.2841457+00	0.2400	2.8662304+00	0.28031683-00	0.93664874+00
0.0220	1.3064108+00	0.2500	2.9227950+00	L1	L2
0.0240	1.3281929+00	0.2600	2.9787903+00	0.65911592+00	0.62029297+00
0.0260	1.3495360+00	0.2700	3.0342530+00	S1	Q
0.0280	1.3704769+00	0.2800	3.0892161+00	0.28031706-00	0.24091268+01
0.0300	1.3910467+00	0.2900	3.1437103+00	L3	Q/LAMDA
0.0320	1.4112725+00	0.3000	3.1977632+00	0.61587147+00	0.60331857+00

$\beta = .4$

T	X(T)	1/LAM1	X(T)/LAM1
0.	9.3664988-01	0.	3.5587913-01
0.010	9.7896693-01	3.7994893-03	3.7195744-01
0.020	1.0099576+00	7.5989786-03	3.8373232-01
0.030	1.0369747+00	1.1398468-02	3.9399742-01
0.040	1.0615161+00	1.5197957-02	4.0332190-01
0.050	1.0842744+00	1.8997447-02	4.1196890-01
0.060	1.1056481+00	2.2796936-02	4.2008981-01
0.070	1.1258949+00	2.6596425-02	4.2778255-01
0.080	1.1451943+00	3.0395914-02	4.3511534-01
0.090	1.1636789+00	3.4195404-02	4.4213855-01
0.100	1.1814491+00	3.7994893-02	4.4889033-01
0.150	1.2619037+00	5.6992339-02	4.7945896-01
0.200	1.3320067+00	7.5989786-02	5.0609452-01
0.250	1.3946130+00	9.4987234-02	5.2988172-01
0.300	1.4513408+00	1.1398468-01	5.5143540-01
0.350	1.5032338+00	1.3298212-01	5.7115209-01
0.400	1.5510227+00	1.5197957-01	5.8930941-01
0.500	1.6363385+00	1.8997447-01	6.2172506-01
0.600	1.7103905+00	2.2796936-01	6.4986105-01
0.700	1.7752555+00	2.6596425-01	6.7450643-01
0.800	1.8324446+00	3.0395915-01	6.9623538-01
0.900	1.8831166+00	3.4195404-01	7.1548812-01
1.000	1.9281934+00	3.7994893-01	7.3261502-01
1.200	2.0044421+00	4.5593871-01	7.6158563-01
1.400	2.0658444+00	5.3192850-01	7.8491539-01
1.600	2.1157538+00	6.0791829-01	8.0387840-01
1.800	2.1566601+00	6.8390808-01	8.1942068-01
2.000	2.1904477+00	7.5989787-01	8.3225827-01
2.200	2.2185670+00	8.3588765-01	8.4294026-01
2.400	2.2421273+00	9.1187743-01	8.5189197-01
2.600	2.2620018+00	9.8786722-01	8.5944515-01
2.800	2.2788866+00	1.0638570+00	8.6586055-01
3.000	2.2933196+00	1.1398468+00	8.7134432-01
4.000	2.3411431+00	1.5197957+00	8.8951482-01
5.000	2.3665209+00	1.8997447+00	8.9915709-01
6.000	2.3813043+00	2.2796936+00	9.0477403-01
7.000	2.3904627+00	2.6596425+00	9.0825375-01
8.000	2.3963701+00	3.0395915+00	9.1049826-01
9.000	2.4002866+00	3.4195404+00	9.1198632-01
10.000	2.4029347+00	3.7994893+00	9.1299248-01

$\beta = .6$

Z	H(Z)	Z	H(Z)	Z	H(Z)
0.	1.0000000+00	0.0340	1.2906275+00	0.3200	2.7116972+00
0.00005	1.0011007+00	0.0360	1.3042734+00	0.3400	2.7960571+00
0.00010	1.0020481+00	0.0380	1.3177560+00	0.3600	2.8795813+00
0.00015	1.0029380+00	0.0400	1.3310850+00	0.3800	2.9623469+00
0.0002	1.0037907+00	0.0420	1.3442693+00	0.4000	3.0444222+00
0.0003	1.0054191+00	0.0440	1.3573167+00	0.4200	3.1258670+00
0.0004	1.0069740+00	0.0460	1.3702346+00	0.4400	3.2067342+00
0.0005	1.0084745+00	0.0480	1.3830293+00	0.4600	3.2870703+00
0.0006	1.0099319+00	0.0500	1.3957069+00	0.4800	3.3669170+00
0.0007	1.0113538+00	0.0550	1.4269230+00	0.5000	3.4463117+00
0.0008	1.0127454+00	0.0600	1.4575133+00	0.5200	3.5252876+00
0.0010	1.0154525+00	0.0650	1.4875390+00	0.5400	3.6038749+00
0.0012	1.0180755+00	0.0700	1.5170510+00	0.5600	3.6821009+00
0.0014	1.0206290+00	0.0750	1.5460927+00	0.5800	3.7599900+00
0.0016	1.0231238+00	0.0800	1.5747014+00	0.6000	3.8375646+00
0.0018	1.0255673+00	0.0850	1.6029097+00	0.6200	3.9148452+00
0.0020	1.0279658+00	0.0900	1.6307458+00	0.6400	3.9918501+00
0.0025	1.0337938+00	0.0950	1.6582351+00	0.6600	4.0685967+00
0.0030	1.0394217+00	0.1000	1.6853998+00	0.6800	4.1451005+00
0.0035	1.0448855+00	0.1050	1.7122601+00	0.7000	4.2213755+00
0.0040	1.0502104+00	0.1100	1.7388340+00	0.7500	4.4111478+00
0.0045	1.0554152+00	0.1150	1.7651377+00	0.8000	4.5997519+00
0.0050	1.0605144+00	0.1200	1.7911865+00	0.8500	4.7873365+00
0.0055	1.0655195+00	0.1250	1.8169935+00	0.9000	4.9740262+00
0.0060	1.0704398+00	0.1300	1.8425714+00	0.9500	5.1599252+00
0.0065	1.0752832+00	0.1350	1.8679315+00	1.0000	5.3451221+00
0.0070	1.0800561+00	0.1400	1.8930844+00	C	D
0.0075	1.0847639+00	0.1450	1.9180400+00	0.19773370+02	0.18544350-00
0.0080	1.0894116+00	0.1500	1.9428071+00	LAM1	LAM2
0.0085	1.0940034+00	0.1600	1.9918094+00	0.18620256+01	0.47007091+01
0.0090	1.0985427+00	0.1700	2.0401519+00	Q/LAM1	R
0.0095	1.1030329+00	0.1800	2.0878880+00	0.87107140+00	0.12601675+01
0.0100	1.1074767+00	0.1900	2.1350644+00	LAMDA	D*LAMDA
0.0120	1.1248376+00	0.2000	2.1817226+00	0.27778956+01	0.51514267+00
0.0140	1.1416258+00	0.2100	2.2278999+00	LAM3	R1
0.0160	1.1579331+00	0.2200	2.2736293+00	0.12815033+02	0.12601673+01
0.0180	1.1738273+00	0.2300	2.3189408+00	S	P
0.0200	1.1893603+00	0.2400	2.3638614+00	0.26756116-00	0.78782944+00
0.0220	1.2045727+00	0.2500	2.4084157+00	L1	L2
0.0240	1.2194978+00	0.2600	2.4526260+00	0.67030081+00	0.60916024+00
0.0260	1.2341627+00	0.2700	2.4965127+00	S1	Q
0.0280	1.2485900+00	0.2800	2.5400945+00	0.26756141-00	0.16219573+01
0.0300	1.2627992+00	0.2900	2.5833887+00	L3	Q/LAMDA
0.0320	1.2768069+00	0.3000	2.6264109+00	0.59782212+00	0.58387986+00

$\beta = .6$

T	X(T)	T/LAM1	X(T)/LAM1
0.	7.8783209-01	0.	4.2310485-01
0.010	8.1641033-01	5.3704952-03	4.3845278-01
0.020	8.3690437-01	1.0740990-02	4.4945909-01
0.030	8.5455558-01	1.6111486-02	4.5893866-01
0.040	8.7043697-01	2.1481981-02	4.6746776-01
0.050	8.8504589-01	2.6852476-02	4.7531347-01
0.060	8.9866896-01	3.2222971-02	4.8262974-01
0.070	9.1149176-01	3.7593466-02	4.8951622-01
0.080	9.2364426-01	4.2963961-02	4.9604270-01
0.090	9.3522180-01	4.8334457-02	5.0226042-01
0.100	9.4629716-01	5.3704952-02	5.0820844-01
0.150	9.9581885-01	8.0557426-02	5.3480405-01
0.200	1.0382206+00	1.0740990-01	5.5757586-01
0.250	1.0755675+00	1.3426238-01	5.7763301-01
0.300	1.1090249+00	1.6111485-01	5.9560128-01
0.350	1.1393389+00	1.8796733-01	6.1188143-01
0.400	1.1670274+00	2.1481981-01	6.2675151-01
0.500	1.2159607+00	2.6852476-01	6.5303109-01
0.600	1.2579610+00	3.2222971-01	6.7558734-01
0.700	1.2944226+00	3.7593466-01	6.9516901-01
0.800	1.3263326+00	4.2963961-01	7.1230627-01
0.900	1.3544299+00	4.8334457-01	7.2739596-01
1.000	1.3792900+00	5.3704952-01	7.4074702-01
1.200	1.4210530+00	6.4445941-01	7.6317586-01
1.400	1.4544078+00	7.5186933-01	7.8108899-01
1.600	1.4813119+00	8.5927923-01	7.9553786-01
1.800	1.5031938+00	9.6668913-01	8.0728952-01
2.000	1.5211214+00	1.0740990+00	8.1691750-01
2.200	1.5359069+00	1.1815089+00	8.2485807-01
2.400	1.5481762+00	1.2889188+00	8.3144728-01
2.600	1.5584164+00	1.3963288+00	8.3694676-01
2.800	1.5670098+00	1.5037387+00	8.4156185-01
3.000	1.5742586+00	1.6111486+00	8.4545480-01
4.000	1.5972723+00	2.1481981+00	8.5781432-01
5.000	1.6083672+00	2.6852476+00	8.6377285-01
6.000	1.6141528+00	3.2222971+00	8.6688000-01
7.000	1.6173419+00	3.7593467+00	8.6859268-01
8.000	1.6191694+00	4.2963962+00	8.6957418-01
9.000	1.6202464+00	4.8334457+00	8.7015254-01
10.000	1.6208942+00	5.3704953+00	8.7050046-01

$\beta = .8$

Z	H(Z)
0.	1.0000000+00
0.00005	1.0007957+00
0.00010	1.0014857+00
0.00015	1.0021359+00
0.0002	1.0027604+00
0.0003	1.0039560+00
0.0004	1.0051007+00
0.0005	1.0062077+00
0.0006	1.0072846+00
0.0007	1.0083369+00
0.0008	1.0093679+00
0.0010	1.0113773+00
0.0012	1.0133280+00
0.0014	1.0152303+00
0.0016	1.0170913+00
0.0018	1.0189167+00
0.0020	1.0207102+00
0.0025	1.0250765+00
0.0030	1.0293023+00
0.0035	1.0334128+00
0.0040	1.0374256+00
0.0045	1.0413538+00
0.0050	1.0452075+00
0.0055	1.0489949+00
0.0060	1.0527225+00
0.0065	1.0563957+00
0.0070	1.0600190+00
0.0075	1.0635966+00
0.0080	1.0671316+00
0.0085	1.0706270+00
0.0090	1.0740854+00
0.0095	1.0775091+00
0.0100	1.0809001+00
0.0120	1.0941712+00
0.0140	1.1070377+00
0.0160	1.1195651+00
0.0180	1.1318016+00
0.0200	1.1437838+00
0.0220	1.1555411+00
0.0240	1.1670969+00
0.0260	1.1784708+00
0.0280	1.1896789+00
0.0300	1.2007350+00
0.0320	1.2116511+00
0.0340	1.2224373+00
0.0360	1.2331027+00
0.0380	1.2436550+00
0.0400	1.2541015+00
0.0420	1.2644483+00
0.0440	1.2747012+00
0.0460	1.2848650+00
0.0480	1.2949446+00
0.0500	1.3049442+00
0.0550	1.3296172+00
0.0600	1.3538650+00
0.0650	1.3777304+00
0.0700	1.4012491+00
0.0750	1.4244514+00
0.0800	1.4473633+00
0.0850	1.4700070+00
0.0900	1.4924023+00
0.0950	1.5145664+00
0.1000	1.5365144+00
0.1050	1.5582602+00
0.1100	1.5798159+00
0.1150	1.6011926+00
0.1200	1.6224002+00
0.1250	1.6434480+00
0.1300	1.6643442+00
0.1350	1.6850964+00
0.1400	1.7057117+00
0.1450	1.7261966+00
0.1500	1.7465570+00
0.1600	1.7869262+00
0.1700	1.8268595+00
0.1800	1.8663918+00
0.1900	1.9055537+00
0.2000	1.9443723+00
0.2100	1.9828717+00
0.2200	2.0210738+00
0.2300	2.0589978+00
0.2400	2.0966614+00
0.2500	2.1340805+00
0.2600	2.1712694+00
0.2700	2.2082419+00
0.2800	2.2450096+00
0.2900	2.2815839+00
0.3000	2.3179752+00
0.3200	2.3902454+00
0.3400	2.4618881+00
0.3600	2.5329622+00
0.3800	2.6035183+00
0.4000	2.6736014+00
0.4200	2.7432508+00
0.4400	2.8125014+00
0.4600	2.8813839+00
0.4800	2.9499259+00
0.5000	3.0181530+00
0.5200	3.0860869+00
0.5400	3.1537479+00
0.5600	3.2211543+00
0.5800	3.2883230+00
0.6000	3.3552687+00
0.6200	3.4220057+00
0.6400	3.4885463+00
0.6600	3.5549024+00
0.6800	3.6210846+00
0.7000	3.6871028+00
0.7500	3.8514890+00
0.8000	4.0150301+00
0.8500	4.1778302+00
0.9000	4.3399764+00
0.9500	4.5015423+00
1.0000	4.6625910+00

C	D
0.10592979+02	0.26229200-00
LAM1	LAM2
0.15059406+01	0.29017860+01
Q/LAM1	R
0.83169676+00	0.11265043+01
LAMDA	D*LAMDA
0.21856361+01	0.57327486+00
LAM3	R1
0.61188705+01	0.11265041+01
S	P
0.25516939-00	0.70850563+00
L1	L2
0.68901713+00	0.60744881+00
S1	Q
0.25516960-00	0.12524860+01
L3	Q/LAMDA
0.5860541D+00	0.57305331+00

$\beta = 1.0$

z	H(z)	z	H(z)	z	H(z)
0.	1.0000000+00	0.0340	1.1836502+00	0.3200	2.1920212+00
0.00005	1.0000297+00	0.0360	1.1925822+00	0.3400	2.2551532+00
0.00010	1.0001188+00	0.0380	1.2014273+00	0.3600	2.3178694+00
0.00015	1.0001973+00	0.0400	1.2101911+00	0.3800	2.3802069+00
0.0002	1.0002963+00	0.0420	1.2188785+00	0.4000	2.4421978+00
0.0003	1.0003535+00	0.0440	1.2274938+00	0.4200	2.5038708+00
0.0004	1.0004717+00	0.0460	1.2360411+00	0.4400	2.5652509+00
0.0005	1.0005610+00	0.0480	1.2445241+00	0.4600	2.6263604+00
0.0006	1.0006274+00	0.0500	1.2529458+00	0.4800	2.6872197+00
0.0007	1.0006746+00	0.0550	1.2737518+00	0.5000	2.7478465+00
0.0008	1.0007058+00	0.0600	1.2942343+00	0.5200	2.8082571+00
0.0010	1.0009127+00	0.0650	1.3144267+00	0.5400	2.8684661+00
0.0012	1.0010704+00	0.0700	1.3343568+00	0.5600	2.9284868+00
0.0014	1.0012243+00	0.0750	1.3540481+00	0.5800	2.9883312+00
0.0016	1.0013751+00	0.0800	1.3735207+00	0.6000	3.0480104+00
0.0018	1.0015231+00	0.0850	1.3927918+00	0.6200	3.1075343+00
0.0020	1.0016687+00	0.0900	1.4118767+00	0.6400	3.1669125+00
0.0025	1.0020235+00	0.0950	1.4307886+00	0.6600	3.2261532+00
0.0030	1.0023676+00	0.1000	1.4495393+00	0.6800	3.2852642+00
0.0035	1.0027027+00	0.1050	1.4681392+00	0.7000	3.3442528+00
0.0040	1.0030303+00	0.1100	1.4865977+00	0.7500	3.4912311+00
0.0045	1.0033513+00	0.1150	1.5049233+00	0.8000	3.6375761+00
0.0050	1.0036665+00	0.1200	1.5231235+00	0.8500	3.7833638+00
0.0055	1.0039768+00	0.1250	1.5412053+00	0.9000	3.9286590+00
0.0060	1.0042831+00	0.1300	1.5591750+00	0.9500	4.0735156+00
0.0065	1.0045861+00	0.1350	1.5770384+00	1.0000	4.2179804+00
0.0070	1.0048865+00	0.1400	1.5948007+00	C	D
0.0075	1.0051849+00	0.1450	1.6124670+00	0.66337319+01	0.34102999-00
0.0080	1.0054655+00	0.1500	1.6300415+00	LAM1	LAM2
0.0085	1.0057530+00	0.1600	1.6649322+00	0.13130352+01	0.20860922+01
0.0090	1.0060376+00	0.1700	1.6995028+00	Q/LAM1	R
0.0095	1.0063196+00	0.1800	1.7337792+00	0.79906701+00	0.10237347+01
0.0100	1.0065990+00	0.1900	1.7677845+00	LAMDA	D*LAMDA
0.0120	1.0076939+00	0.2000	1.8015385+00	0.18415344+01	0.62801847+00
0.0140	1.0087574+00	0.2100	1.8350594+00	LAM3	R1
0.0160	1.0097947+00	0.2200	1.8683629+00	0.36331668+01	0.10237345+01
0.0180	1.0108094+00	0.2300	1.9014634+00	S	P
0.0200	1.0118043+00	0.2400	1.9343738+00	0.24477680-00	0.66157268+00
0.0220	1.0127819+00	0.2500	1.9671060+00	L1	L2
0.0240	1.0137438+00	0.2600	1.9996701+00	0.71301152+00	0.61513983+00
0.0260	1.0146916+00	0.2700	2.0320763+00	S1	Q
0.0280	1.0156267+00	0.2800	2.0643331+00	0.24477696-00	0.10492031+01
0.0300	1.0165500+00	0.2900	2.0964488+00	L3	Q/LAMDA
0.0320	1.0174625+00	0.3000	2.1284309+00	0.58176266+00	0.56974398+00

$\beta = 1.0$

T	X(T)	T/LAM1	X(T)/LAM1
0.	6.6157333-01	0.	5.0385040-01
0.010	6.7918266-01	7.6159417-03	5.1726156-01
0.020	6.9138688-01	1.5231883-02	5.2655622-01
0.030	7.0169088-01	2.2847825-02	5.3440369-01
0.040	7.1081559-01	3.0463767-02	5.4135302-01
0.050	7.1909566-01	3.8079709-02	5.4765907-01
0.060	7.2672427-01	4.5695650-02	5.5346898-01
0.070	7.3382683-01	5.3311592-02	5.5887825-01
0.080	7.4049099-01	6.0927534-02	5.6395363-01
0.090	7.4678115-01	6.8543476-02	5.6874418-01
0.100	7.5274677-01	7.6159418-02	5.7328756-01
0.150	7.7883695-01	1.1423913-01	5.9315769-01
0.200	8.0047702-01	1.5231884-01	6.0963864-01
0.250	8.1905299-01	1.9039855-01	6.2378599-01
0.300	8.3534014-01	2.2847825-01	6.3619019-01
0.350	8.4982824-01	2.6655796-01	6.4722425-01
0.400	8.6285207-01	3.0463767-01	6.5714312-01
0.500	8.8541491-01	3.8079709-01	6.7432684-01
0.600	9.0435413-01	4.5695651-01	6.8875085-01
0.700	9.2050116-01	5.3311592-01	7.0104833-01
0.800	9.3442187-01	6.0927534-01	7.1165026-01
0.900	9.4652402-01	6.8543476-01	7.2086719-01
1.000	9.5711385-01	7.6159418-01	7.2893234-01
1.200	9.7465773-01	9.1391301-01	7.4229366-01
1.400	9.8844062-01	1.0662318+00	7.5279063-01
1.600	9.9939461-01	1.2185507+00	7.6113312-01
1.800	1.0081777+00	1.3708695+00	7.6782227-01
2.000	1.0152703+00	1.5231884+00	7.7322397-01
2.200	1.0210318+00	1.6755072+00	7.7761186-01
2.400	1.0257357+00	1.8278260+00	7.8119437-01
2.600	1.0295935+00	1.9801449+00	7.8413241-01
2.800	1.0327700+00	2.1324637+00	7.8655161-01
3.000	1.0353950+00	2.2847825+00	7.8855083-01
4.000	1.0432148+00	3.0463767+00	7.9450629-01
5.000	1.0464802+00	3.8079709+00	7.9699323-01
6.000	1.0479192+00	4.5695651+00	7.9808916-01
7.000	1.0485804+00	5.3311593+00	7.9859276-01
8.000	1.0488944+00	6.0927535+00	7.9883188-01
9.000	1.0490474+00	6.8543476+00	7.9894838-01
10.000	1.0491234+00	7.6159418+00	7.9900630-01

$\beta = 1.5$

Z	H(Z)
0.	1.0000000+00
0.00005	1.0004426+00
0.00010	1.0008816+00
0.00015	1.0012006+00
0.0002	1.0015564+00
0.0003	1.0022409+00
0.0004	1.0028994+00
0.0005	1.0035386+00
0.0006	1.0041626+00
0.0007	1.0047739+00
0.0008	1.0053743+00
0.0010	1.0065480+00
0.0012	1.0076917+00
0.0014	1.0088103+00
0.0016	1.0099077+00
0.0018	1.0109866+00
0.0020	1.0120492+00
0.0025	1.0146445+00
0.0030	1.0171667+00
0.0035	1.0196290+00
0.0040	1.0220403+00
0.0045	1.0244074+00
0.0050	1.0267355+00
0.0055	1.0290288+00
0.0060	1.0312908+00
0.0065	1.0335242+00
0.0070	1.0357313+00
0.0075	1.0379143+00
0.0080	1.0400750+00
0.0085	1.0422148+00
0.0090	1.0443350+00
0.0095	1.0464369+00
0.0100	1.0485215+00
0.0120	1.0567052+00
0.0140	1.0646749+00
0.0160	1.0724652+00
0.0180	1.0801013+00
0.0200	1.0876030+00
0.0220	1.0949856+00
0.0240	1.1022619+00
0.0260	1.1094421+00
0.0280	1.1165349+00
0.0300	1.1235477+00
0.0320	1.1304870+00
0.0340	1.1373581+00
0.0360	1.1441660+00
0.0380	1.1509149+00
0.0400	1.1576086+00
0.0420	1.1642504+00
0.0440	1.1708434+00
0.0460	1.1773904+00
0.0480	1.1838938+00
0.0500	1.1903559+00
0.0550	1.2063436+00
0.0600	1.2221137+00
0.0650	1.2376892+00
0.0700	1.2530893+00
0.0750	1.2683301+00
0.0800	1.2834256+00
0.0850	1.2983876+00
0.0900	1.3132265+00
0.0950	1.3279515+00
0.1000	1.3425705+00
0.1050	1.3570909+00
0.1100	1.3715189+00
0.1150	1.3858603+00
0.1200	1.4001204+00
0.1250	1.4143037+00
0.1300	1.4284147+00
0.1350	1.4424573+00
0.1400	1.4564348+00
0.1450	1.4703508+00
0.1500	1.4842082+00
0.1600	1.5117583+00
0.1700	1.5391051+00
0.1800	1.5662659+00
0.1900	1.5932559+00
0.2000	1.6200885+00
0.2100	1.6467752+00
0.2200	1.6733267+00
0.2300	1.6997521+00
0.2400	1.7260599+00
0.2500	1.7522577+00
0.2600	1.7783521+00
0.2700	1.8043496+00
0.2800	1.8302557+00
0.2900	1.8560756+00
0.3000	1.8818141+00
0.3200	1.9330638+00
0.3400	1.9840357+00
0.3600	2.0347567+00
0.3800	2.0852495+00
0.4000	2.1355343+00
0.4200	2.1856286+00
0.4400	2.2355478+00
0.4600	2.2853056+00
0.4800	2.3349143+00
0.5000	2.3843847+00
0.5200	2.4337266+00
0.5400	2.4829489+00
0.5600	2.5320597+00
0.5800	2.5810659+00
0.6000	2.6299743+00
0.6200	2.6787910+00
0.6400	2.7275213+00
0.6600	2.7761705+00
0.6800	2.8247430+00
0.7000	2.8732432+00
0.7500	2.9942028+00
0.8000	3.1147886+00
0.8500	3.2350456+00
0.9000	3.3550120+00
0.9500	3.4747195+00
1.0000	3.5941957+00

C	D
0.30632069+01	0.52806389+00
LAM1	LAM2
0.11047913+01	0.13308459+01
Q/LAM1	R
0.74721227+00	0.84428187+00
LAMDA	D*LAMDA
0.14117125+01	0.74547445+00
LAM3	R1
0.17082059+01	0.84428146+00
S	P
0.23274927-00	0.60684741+00
L1	L2
0.78258943+00	0.66778275+00
S1	Q
0.23274943-00	0.82551365+00
L3	Q/LAMDA
0.60715780+00	0.58476041+00

$\beta = 1.5$

T	X(T)	T/LAM1	X(T)/LAM1
0.	6.0684735-01	0.	5.4928684-01
0.010	6.2001053-01	9.0514827-03	5.6120147-01
0.020	6.2887876-01	1.8102966-02	5.6922854-01
0.030	6.3623936-01	2.7154448-02	5.7589097-01
0.040	6.4266670-01	3.6205931-02	5.8170867-01
0.050	6.4842774-01	4.5257414-02	5.8692326-01
0.060	6.5367671-01	5.4308897-02	5.9167436-01
0.070	6.5851371-01	6.3360380-02	5.9605256-01
0.080	6.6300867-01	7.2411862-02	6.0012117-01
0.090	6.6721308-01	8.1463345-02	6.0392678-01
0.100	6.7116628-01	9.0514828-02	6.0750501-01
0.150	6.8806690-01	1.3577224-01	6.2280257-01
0.200	7.0160872-01	1.8102966-01	6.3505993-01
0.250	7.1289120-01	2.2628707-01	6.4527225-01
0.300	7.2252490-01	2.7154448-01	6.5399218-01
0.350	7.3089241-01	3.1680190-01	6.6156602-01
0.400	7.3825261-01	3.6205931-01	6.6822809-01
0.500	7.5064337-01	4.5257414-01	6.7944357-01
0.600	7.6069334-01	5.4308896-01	6.8854028-01
0.700	7.6900972-01	6.3360379-01	6.9606784-01
0.800	7.7599339-01	7.2411863-01	7.0238909-01
0.900	7.8192413-01	8.1463345-01	7.0775728-01
1.000	7.8700558-01	9.0514828-01	7.1235675-01
1.200	7.9519731-01	1.0861779+00	7.1977149-01
1.400	8.0142753-01	1.2672076+00	7.2541077-01
1.600	8.0624175-01	1.4482373+00	7.2976834-01
1.800	8.1000636-01	1.6292669+00	7.3317587-01
2.000	8.1297753-01	1.8102966+00	7.3586522-01
2.200	8.1533983-01	1.9913262+00	7.3800345-01
2.400	8.1722939-01	2.1723559+00	7.3971379-01
2.600	8.1874843-01	2.3533855+00	7.4108874-01
2.800	8.1997479-01	2.5344152+00	7.4219878-01
3.000	8.2096851-01	2.7154449+00	7.4309824-01
4.000	8.2377539-01	3.6205932+00	7.4563889-01
5.000	8.2482532-01	4.5257415+00	7.4658923-01
6.000	8.2523391-01	5.4308897+00	7.4695907-01
7.000	8.2539759-01	6.3360381+00	7.4710722-01
8.000	8.2546467-01	7.2411863+00	7.4716793-01
9.000	8.2549268-01	8.1463346+00	7.4719329-01
10.000	8.2550455-01	9.0514829+00	7.4720404-01

$\beta = 2.0$

z	H(z)	z	H(z)	z	H(z)
0.	1.0000000+00	0.0360	1.1243943+00	0.3600	1.9066545+00
0.00005	1.0003716+00	0.0380	1.1302598+00	0.3800	1.9512921+00
0.00010	1.0006995+00	0.0400	1.1360793+00	0.4000	1.9957650+00
0.00015	1.0010109+00	0.0420	1.1418556+00	0.4200	2.0400873+00
0.0002	1.0013115+00	0.0440	1.1475912+00	0.4400	2.0842719+00
0.0003	1.0018908+00	0.0460	1.1532884+00	0.4600	2.1283295+00
0.0004	1.0024487+00	0.0480	1.1589493+00	0.4800	2.1722702+00
0.0005	1.0029908+00	0.0500	1.1645758+00	0.5000	2.2161028+00
0.0006	1.0035205+00	0.0550	1.1785024+00	0.5200	2.2598351+00
0.0007	1.0040397+00	0.0600	1.1922478+00	0.5400	2.3034741+00
0.0008	1.0045502+00	0.0650	1.2058311+00	0.5600	2.3470263+00
0.0010	1.0055486+00	0.0700	1.2192684+00	0.5800	2.3904975+00
0.0012	1.0065223+00	0.0750	1.2325731+00	0.6000	2.4338929+00
0.0014	1.0074756+00	0.0800	1.2457570+00	0.6200	2.4772173+00
0.0016	1.0084115+00	0.0850	1.2588299+00	0.6400	2.5204751+00
0.0018	1.0093321+00	0.0900	1.2718006+00	0.6600	2.5636703+00
0.0020	1.0102394+00	0.0950	1.2846768+00	0.6800	2.6068067+00
0.0025	1.0124572+00	0.1000	1.2974650+00	0.7000	2.6498874+00
0.0030	1.0146151+00	0.1050	1.3101715+00	0.7500	2.7573658+00
0.0035	1.0167234+00	0.1100	1.3228016+00	0.8000	2.8645584+00
0.0040	1.0187898+00	0.1150	1.3353600+00	0.8500	2.9715004+00
0.0045	1.0208198+00	0.1200	1.3478512+00	0.9000	3.0782212+00
0.0050	1.0228176+00	0.1250	1.3602789+00	0.9500	3.1847458+00
0.0055	1.0247868+00	0.1300	1.3726470+00	1.0000	3.2910954+00
0.0060	1.0267301+00	0.1350	1.3849586+00		
0.0065	1.0286497+00	0.1400	1.3972166+00	C	D
0.0070	1.0305477+00	0.1450	1.4094240+00	0.19604269+01	0.68085150+00
0.0075	1.0324257+00	0.1500	1.4215832+00	LAM1	LAM2
0.0080	1.0342852+00	0.1600	1.4457662+00	0.10373147+01	0.11140326+01
0.0085	1.0361275+00	0.1700	1.4697825+00	Q/LAM1	R
0.0090	1.0379536+00	0.1800	1.4936465+00	0.72462248+00	0.73243695+00
0.0095	1.0397645+00	0.1900	1.5173711+00	LAMDA	D*LAMDA
0.0100	1.0415612+00	0.2000	1.5409671+00	0.12231729+01	0.83279914+00
0.0120	1.0486194+00	0.2100	1.5644444+00	LAM3	R1
0.0140	1.0555002+00	0.2200	1.5878117+00	0.12337518+01	0.73243672+00
0.0160	1.0622320+00	0.2300	1.6110767+00	S	P
0.0180	1.0688359+00	0.2400	1.6342465+00	0.23848575-00	0.58802344+00
0.0200	1.0753281+00	0.2500	1.6573273+00	L1	L2
0.0220	1.0817213+00	0.2600	1.6803246+00	0.84805235+00	0.74459857+00
0.0240	1.0880260+00	0.2700	1.7032438+00	S1	Q
0.0260	1.0942507+00	0.2800	1.7260894+00	0.23848595-00	0.75166155+00
0.0280	1.1004027+00	0.2900	1.7488659+00	L3	Q/LAMDA
0.0300	1.1064881+00	0.3000	1.7715770+00	0.67416191+00	0.61451779+00
0.0320	1.1125122+00	0.3200	1.8168172+00		
0.0340	1.1184796+00	0.3400	1.8618358+00		

$\beta = 2.0$

T	X(T)	T/LAM1	X(T)/LAM1
0.	5.8802335-01	0.	5.6687074-01
0.010	5.9971253-01	9.6402758-03	5.7813943-01
0.020	6.0747789-01	1.9280552-02	5.8562545-01
0.030	6.1386696-01	2.8920828-02	5.9178469-01
0.040	6.1940513-01	3.8561103-02	5.9712363-01
0.050	6.2433667-01	4.8201380-02	6.0187778-01
0.060	6.2880273-01	5.7841655-02	6.0618319-01
0.070	6.3289492-01	6.7481931-02	6.1012816-01
0.080	6.3667722-01	7.7122207-02	6.1377442-01
0.090	6.4019678-01	8.6762483-02	6.1716736-01
0.100	6.4348955-01	9.6402760-02	6.2034169-01
0.150	6.5737794-01	1.4460414-01	6.3373048-01
0.200	6.6826842-01	1.9280552-01	6.4422920-01
0.250	6.7716441-01	2.4100690-01	6.5280518-01
0.300	6.8462138-01	2.8920827-01	6.5999390-01
0.350	6.9098617-01	3.3740965-01	6.6612974-01
0.400	6.9649248-01	3.8561104-01	6.7143798-01
0.500	7.0555068-01	4.8201380-01	6.8017033-01
0.600	7.1268418-01	5.7841654-01	6.8704722-01
0.700	7.1842730-01	6.7481931-01	6.9258374-01
0.800	7.2312764-01	7.7122207-01	6.9711500-01
0.900	7.2702401-01	8.6762483-01	7.0087121-01
1.000	7.3028714-01	9.6402760-01	7.0401696-01
1.200	7.3538700-01	1.1568331+00	7.0893336-01
1.400	7.3911739-01	1.3496386+00	7.1252956-01
1.600	7.4189987-01	1.5424442+00	7.1521195-01
1.800	7.4400662-01	1.7352497+00	7.1724291-01
2.000	7.4562074-01	1.9280552+00	7.1879897-01
2.200	7.4686933-01	2.1208607+00	7.2000265-01
2.400	7.4784284-01	2.3136662+00	7.2094113-01
2.600	7.4860690-01	2.5064718+00	7.2167770-01
2.800	7.4920995-01	2.6992773+00	7.2225906-01
3.000	7.4968821-01	2.8920828+00	7.2272012-01
4.000	7.5097213-01	3.8561104+00	7.2395785-01
5.000	7.5141114-01	4.8201380+00	7.2438107-01
6.000	7.5156823-01	5.7841656+00	7.2453252-01
7.000	7.5162612-01	6.7481932+00	7.2458832-01
8.000	7.5164791-01	7.7122208+00	7.2460933-01
9.000	7.5165624-01	8.6762483+00	7.2461736-01
10.000	7.5165946-01	9.6402760+00	7.2462046-01

$\beta = 3.0$

z	H(z)	z	H(z)	z	H(z)
0.	1.0000000+00	0.0340	1.1046229+00	0.3200	1.7252834+00
0.00005	1.0003225+00	0.0360	1.1098658+00	0.3400	1.7653379+00
0.00010	1.0006077+00	0.0380	1.1150659+00	0.3600	1.8052177+00
0.00015	1.0008790+00	0.0400	1.1202259+00	0.3800	1.8449392+00
0.0002	1.0011411+00	0.0420	1.1253483+00	0.4000	1.8845170+00
0.0003	1.0016465+00	0.0440	1.1304352+00	0.4200	1.9239635+00
0.0004	1.0021337+00	0.0460	1.1354885+00	0.4400	1.9632899+00
0.0005	1.0026075+00	0.0480	1.1405103+00	0.4600	2.0025060+00
0.0006	1.0030705+00	0.0500	1.1455019+00	0.4800	2.0416203+00
0.0007	1.0035248+00	0.0550	1.1578592+00	0.5000	2.0806406+00
0.0008	1.0039714+00	0.0600	1.1700579+00	0.5200	2.1195738+00
0.0010	1.0048457+00	0.0650	1.1821150+00	0.5400	2.1584262+00
0.0012	1.0056988+00	0.0700	1.1940442+00	0.5600	2.1972034+00
0.0014	1.0065345+00	0.0750	1.2058574+00	0.5800	2.2359104+00
0.0016	1.0073553+00	0.0800	1.2175646+00	0.6000	2.2745519+00
0.0018	1.0081630+00	0.0850	1.2291746+00	0.6200	2.3131321+00
0.0020	1.0089594+00	0.0900	1.2406950+00	0.6400	2.3516547+00
0.0025	1.0109071+00	0.0950	1.2521324+00	0.6600	2.3901234+00
0.0030	1.0128034+00	0.1000	1.2634927+00	0.6800	2.4285412+00
0.0035	1.0146574+00	0.1050	1.2747813+00	0.7000	2.4669111+00
0.0040	1.0164752+00	0.1100	1.2860027+00	0.7500	2.5626441+00
0.0045	1.0182619+00	0.1150	1.2971612+00	0.8000	2.6581315+00
0.0050	1.0200211+00	0.1200	1.3082606+00	0.8500	2.7534040+00
0.0055	1.0217556+00	0.1250	1.3193044+00	0.9000	2.8484874+00
0.0060	1.0234678+00	0.1300	1.3302956+00	0.9500	2.9434032+00
0.0065	1.0251598+00	0.1350	1.3412372+00	1.0000	3.0381699+00
0.0070	1.0268332+00	0.1400	1.3521319+00	C	D
0.0075	1.0284893+00	0.1450	1.3629820+00	0.12796610+01	0.86857689+00
0.0080	1.0301296+00	0.1500	1.3737897+00	LAM1	LAM2
0.0085	1.0317549+00	0.1600	1.3952862+00	0.10049698+01	0.10149464+01
0.0090	1.0333664+00	0.1700	1.4166362+00	Q/LAM1	R
0.0095	1.0349648+00	0.1800	1.4378523+00	0.71241128+00	0.61851797+00
0.0100	1.0365508+00	0.1900	1.4589458+00	LAMDA	D*LAMDA
0.0120	1.0427845+00	0.2000	1.4799264+00	0.10743227+01	0.93313192+00
0.0140	1.0488650+00	0.2100	1.5008027+00	LAM3	R1
0.0160	1.0548168+00	0.2200	1.5215824+00	0.10299920+01	0.61851786+00
0.0180	1.0606579+00	0.2300	1.5422722+00	S	P
0.0200	1.0664023+00	0.2400	1.5628784+00	0.26639874-00	0.57878315+00
0.0220	1.0720609+00	0.2500	1.5834065+00	L1	L2
0.0240	1.0776427+00	0.2600	1.6038614+00	0.93544494+00	0.87937392+00
0.0260	1.0831552+00	0.2700	1.6242478+00	S1	Q
0.0280	1.0886045+00	0.2800	1.6445696+00	0.26639897-00	0.71595182+00
0.0300	1.0939959+00	0.2900	1.6648308+00	L3	Q/LAMDA
0.0320	1.0993341+00	0.3000	1.6850348+00	0.83067193+00	0.66442152+00

β = 3.0

T	X(T)	T/LAM1	X(T)/LAM1
		0.	5.7592076-01
0.	5.7878296-01	9.9505477-03	5.8684332-01
0.010	5.8975981-01	1.9901095-02	5.9404054-01
0.020	5.9699280-01	2.9851643-02	5.9993159-01
0.030	6.0291312-01	3.9802191-02	6.0501567-01
0.040	6.0802248-01	4.9752738-02	6.0952498-01
0.050	6.1255420-01	5.9703286-02	6.1359354-01
0.060	6.1664297-01	6.9653834-02	6.1730843-01
0.070	6.2037632-01	7.9604381-02	6.2073047-01
0.080	6.2381537-01	8.9554930-02	6.2390442-01
0.090	6.2700510-01	9.9505477-02	6.2686451-01
0.100	6.2997990-01	1.4925821-01	6.3924141-01
0.150	6.4241831-01	1.9901095-01	6.4880852-01
0.200	6.5203296-01	2.4876370-01	6.5651770-01
0.250	6.5978045-01	2.9851643-01	6.6289533-01
0.300	6.6618978-01	3.4826917-01	6.6826926-01
0.350	6.7159042-01	3.9802191-01	6.7285994-01
0.400	6.7620391-01	4.9752739-01	6.8027542-01
0.500	6.8365625-01	5.9703286-01	6.8597393-01
0.600	6.8938308-01	6.9653834-01	6.9045253-01
0.700	6.9388394-01	7.9604382-01	6.9403182-01
0.800	6.9748101-01	8.9554930-01	6.9692994-01
0.900	7.0039354-01	9.9505478-01	6.9930130-01
1.000	7.0277668-01	1.1940657+00	7.0288570-01
1.200	7.0637890-01	1.3930767+00	7.0539190-01
1.400	7.0889755-01	1.5920876+00	7.0718052-01
1.600	7.1069506-01	1.7910986+00	7.0847754-01
1.800	7.1199853-01	1.9901096+00	7.0943022-01
2.000	7.1295595-01	2.1891205+00	7.1013740-01
2.200	7.1366664-01	2.3881314+00	7.1066702-01
2.400	7.1419889-01	2.5871424+00	7.1106668-01
2.600	7.1460054-01	2.7861534+00	7.1137025-01
2.800	7.1490562-01	2.9851643+00	7.1160216-01
3.000	7.1513867-01	3.9802191+00	7.1217097-01
4.000	7.1571032-01	4.9752739+00	7.1233581-01
5.000	7.1587597-01	5.9703287+00	7.1238665-01
6.000	7.1592707-01	6.9653835+00	7.1240301-01
7.000	7.1594352-01	7.9604383+00	7.1240844-01
8.000	7.1594897-01	8.9554930+00	7.1241029-01
9.000	7.1595082-01	9.9505478+00	7.1241093-01
10.000	7.1595146-01		

$\beta = \infty$ (Grey)

Z	H(Z)	Z	H(Z)	Z	H(Z)
0.	1.0000000+00	0.0340	1.0981828+00	0.3200	1.6802130+00
0.00005	1.0003009+00	0.0360	1.1031068+00	0.3400	1.7177165+00
0.00010	1.0005673+00	0.0380	1.1079907+00	0.3600	1.7550513+00
0.00015	1.0008207+00	0.0400	1.1128369+00	0.3800	1.7922331+00
0.0002	1.0010657+00	0.0420	1.1176477+00	0.4000	1.8292758+00
0.0003	1.0015381+00	0.0440	1.1224251+00	0.4200	1.8661916+00
0.0004	1.0019937+00	0.0460	1.1271711+00	0.4400	1.9029909+00
0.0005	1.0024369+00	0.0480	1.1318871+00	0.4600	1.9396831+00
0.0006	1.0028701+00	0.0500	1.1365750+00	0.4800	1.9762767+00
0.0007	1.0032952+00	0.0550	1.1481795+00	0.5000	2.0127790+00
0.0008	1.0037132+00	0.0600	1.1596348+00	0.5200	2.0491967+00
0.0010	1.0045316+00	0.0650	1.1709563+00	0.5400	2.0855358+00
0.0012	1.0053304+00	0.0700	1.1821572+00	0.5600	2.1218018+00
0.0014	1.0061128+00	0.0750	1.1932484+00	0.5800	2.1579995+00
0.0016	1.0068814+00	0.0800	1.2042394+00	0.6000	2.1941333+00
0.0018	1.0076380+00	0.0850	1.2151384+00	0.6200	2.2302073+00
0.0020	1.0083839+00	0.0900	1.2259525+00	0.6400	2.2662253+00
0.0025	1.0102089+00	0.0950	1.2366881+00	0.6600	2.3021906+00
0.0030	1.0119862+00	0.1000	1.2473505+00	0.6800	2.3381062+00
0.0035	1.0137241+00	0.1050	1.2579449+00	0.7000	2.3739752+00
0.0040	1.0154285+00	0.1100	1.2684755+00	0.7500	2.4634600+00
0.0045	1.0171039+00	0.1150	1.2789464+00	0.8000	2.5527047+00
0.0050	1.0187537+00	0.1200	1.2893610+00	0.8500	2.6417390+00
0.0055	1.0203805+00	0.1250	1.2997229+00	0.9000	2.7305880+00
0.0060	1.0219866+00	0.1300	1.3100348+00	0.9500	2.8192727+00
0.0065	1.0235738+00	0.1350	1.3202994+00	1.0000	2.9078109+00
0.0070	1.0251437+00	0.1400	1.3305192+00	C	D
0.0075	1.0266976+00	0.1450	1.3406967+00	0.	0.40000000-00
0.0080	1.0282366+00	0.1500	1.3508337+00	LAM1	LAM2
0.0085	1.0297618+00	0.1600	1.3709944+00	0.09999999+01	0.09999999+01
0.0090	1.0312741+00	0.1700	1.3910152+00	Q/LAM1	R
0.0095	1.0327741+00	0.1800	1.4109082+00	0.71044575+00	0.54930636+00
0.0100	1.0342627+00	0.1900	1.4306839+00	LAMDA	D*LAMDA
0.0120	1.0401137+00	0.2000	1.4503516+00	0.09999999+01	0.40000000-00
0.0140	1.0458219+00	0.2100	1.4699194+00	LAM3	R1
0.0160	1.0514098+00	0.2200	1.4893946+00	0.09999999+01	0.54930613+00
0.0180	1.0568942+00	0.2300	1.5087837+00	S	P
0.0200	1.0622883+00	0.2400	1.5280926+00	0.29999984-00	0.57735027+00
0.0220	1.0676021+00	0.2500	1.5473264+00	L1	L2
0.0240	1.0728440+00	0.2600	1.5664900+00	0.09999999+01	0.09999999+01
0.0260	1.0780209+00	0.2700	1.5855876+00	S1	Q
0.0280	1.0831387+00	0.2800	1.6046232+00	0.30000000-00	0.71044575+00
0.0300	1.0882021+00	0.2900	1.6236004+00	L3	Q/LAMDA
0.0320	1.0932156+00	0.3000	1.6425225+00	0.09999999+01	0.71044575+00

$\beta = \infty$ (Grey)

T	X(T)	T/LAM1	X(T)/LAM1
0.	5.7735037-01	0.	5.7735037-01
0.010	5.8822440-01	9.9999999-03	5.8822440-01
0.020	5.9537739-01	2.0000000-02	5.9537739-01
0.030	6.0122681-01	3.0000000-02	6.0122681-01
0.040	6.0627103-01	3.9999999-02	6.0627103-01
0.050	6.1074179-01	4.9999999-02	6.1074179-01
0.060	6.1477296-01	5.9999999-02	6.1477296-01
0.070	6.1845145-01	6.9999999-02	6.1845145-01
0.080	6.2183794-01	7.9999999-02	6.2183794-01
0.090	6.2497712-01	8.9999999-02	6.2497712-01
0.100	6.2790314-01	1.0000000-01	6.2790314-01
0.150	6.4011869-01	1.5000000-01	6.4011869-01
0.200	6.4953676-01	2.0000000-01	6.4953676-01
0.250	6.5710710-01	2.5000000-01	6.5710710-01
0.300	6.6335455-01	3.0000000-01	6.6335455-01
0.350	6.6860610-01	3.5000000-01	6.6860610-01
0.400	6.7308144-01	4.0000000-01	6.7308144-01
0.500	6.8028510-01	5.0000000-01	6.8028510-01
0.600	6.8579397-01	5.9999999-01	6.8579397-01
0.700	6.9010223-01	6.9999999-01	6.9010223-01
0.800	6.9352821-01	7.9999999-01	6.9352821-01
0.900	6.9628811-01	8.9999999-01	6.9628811-01
1.000	6.9853474-01	1.0000000+00	6.9853474-01
1.200	7.0190461-01	1.2000000+00	7.0190461-01
1.400	7.0423532-01	1.4000000+00	7.0423532-01
1.600	7.0588014-01	1.6000000+00	7.0588014-01
1.800	7.0705915-01	1.8000000+00	7.0705915-01
2.000	7.0791490-01	2.0000000+00	7.0791490-01
2.200	7.0854242-01	2.2000000+00	7.0854242-01
2.400	7.0900654-01	2.4000000+00	7.0900654-01
2.600	7.0935231-01	2.6000000+00	7.0935231-01
2.800	7.0961154-01	2.8000000+00	7.0961154-01
3.000	7.0980695-01	3.0000000+00	7.0980695-01
4.000	7.1027002-01	4.0000000+00	7.1027002-01
5.000	7.1039478-01	5.0000000+00	7.1039478-01
6.000	7.1043042-01	6.0000000+00	7.1043042-01
7.000	7.1044101-01	7.0000000+00	7.1044101-01
8.000	7.1044425-01	8.0000000+00	7.1044425-01
9.000	7.1044526-01	9.0000000+00	7.1044526-01
10.000	7.1044559-01	1.0000000+01	7.1044559-01

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Appendix E

SCREENING CONSTANTS

The two-electron screening constants tabulated here, called SIGMA, are defined exactly as in Mayer's report*; N(1) and L(1) are the principal and azimuthal quantum numbers of electron 1, whose ionization potential is sought; N(2) and L(2) refer to electron 2, which partially screens the nucleus from electron 1. The numerical differences between our results and Mayer's are to be attributed to our use of WKB radial charge densities, which depend (for a given orbital) only on the location of the turning points of the classical orbit. The quantity $N^2 G^2/A^2$ (where N = principal quantum number, G = geometric mean of the two turning points, and A = arithmetic mean) is sometimes alleged to be $\ell(\ell+1)$ and sometimes $(\ell+\frac{1}{2})^2$; we have used the average of these two expressions, which yields considerably better results than either one alone.

*H. Mayer, Methods of Opacity Calculations, Los Alamos Scientific Laboratory Report LA-647, 1948.

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
1	0	1	0	6.208910-01	2	1	4	2	2.400387-01
1	0	2	0	2.080151-01	2	1	4	3	2.500000-01
1	0	2	1	2.441002-01	2	1	5	0	1.392529-01
1	0	3	0	9.886788-02	2	1	5	1	1.455113-01
1	0	3	1	1.089244-01	2	1	5	2	1.546948-01
1	0	3	2	1.111111-01	2	1	5	3	1.600000-01
1	0	4	0	5.735979-02	2	1	5	4	1.600000-01
1	0	4	1	6.152907-02	2	1	6	0	9.914227-02
1	0	4	2	6.250000-02	2	1	6	1	1.027859-01
1	0	4	3	6.250000-02	2	1	6	2	1.079887-01
1	0	5	0	3.737385-02	2	1	6	3	1.111105-01
1	0	5	1	3.949329-02	2	1	6	4	1.111111-01
1	0	5	2	4.000000-02	2	1	6	5	1.111111-01
1	0	5	3	4.000000-02	3	0	1	0	8.897916-01
1	0	5	4	4.000000-02	3	0	2	0	7.551039-01
1	0	6	0	2.625829-02	3	0	2	1	7.786646-01
1	0	6	1	2.747954-02	3	0	3	0	5.975397-01
1	0	6	2	2.777778-02	3	0	3	1	6.188576-01
1	0	6	3	2.777778-02	3	0	3	2	6.577428-01
1	0	6	4	2.777778-02	3	0	4	0	4.036547-01
1	0	6	5	2.777778-02	3	0	4	1	4.184495-01
2	0	1	0	8.320682-01	3	0	4	2	4.484516-01
2	0	2	0	6.010982-01	3	0	4	3	4.984614-01
2	0	2	1	6.474848-01	3	0	5	0	2.804291-01
2	0	3	0	3.356020-01	3	0	5	1	2.887060-01
2	0	3	1	3.601640-01	3	0	5	2	3.046531-01
2	0	3	2	4.096007-01	3	0	5	3	3.275267-01
2	0	4	0	2.050060-01	3	0	5	4	3.547493-01
2	0	4	1	2.158618-01	3	0	6	0	2.044483-01
2	0	4	2	2.345699-01	3	0	6	1	2.094201-01
2	0	4	3	2.500000-01	3	0	6	2	2.187207-01
2	0	5	0	1.371542-01	3	0	6	3	2.312613-01
2	0	5	1	1.428093-01	3	0	6	4	2.446235-01
2	0	5	2	1.520025-01	3	0	6	5	2.500000-01
2	0	5	3	1.597041-01	3	1	1	0	9.803013-01
2	0	5	4	1.600000-01	3	1	2	0	8.103590-01
2	0	6	0	9.795006-02	3	1	2	1	8.418086-01
2	0	6	1	1.012523-01	3	1	3	0	6.188569-01
2	0	6	2	1.064628-01	3	1	3	1	6.457783-01
2	0	6	3	1.107820-01	3	1	3	2	6.918537-01
2	0	6	4	1.111111-01	3	1	4	0	4.107078-01
2	0	6	5	1.111111-01	3	1	4	1	4.266868-01
2	1	1	0	9.764060-01	3	1	4	2	4.580371-01
2	1	2	0	6.474842-01	3	1	4	3	5.087250-01
2	1	2	1	7.225206-01	3	1	5	0	2.838243-01
2	1	3	0	3.460735-01	3	1	5	1	2.926365-01
2	1	3	1	3.741357-01	3	1	5	2	3.090722-01
2	1	3	2	4.240726-01	3	1	5	3	3.318951-01
2	1	4	0	2.091811-01	3	1	5	4	3.570369-01
2	1	4	1	2.213123-01	3	1	6	0	2.063440-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
3	1	6	1	2.116146-01	4	1	3	0	7.439146-01
3	1	6	2	2.211734-01	4	1	3	1	7.585460-01
3	1	6	3	2.336408-01	4	1	3	2	7.848866-01
3	1	6	4	2.461973-01	4	1	4	0	6.084969-01
3	1	6	5	2.500000-01	4	1	4	1	6.225872-01
3	2	1	0	1.000000+00	4	1	4	2	6.478892-01
3	2	2	0	9.216006-01	4	1	4	3	6.824951-01
3	2	2	1	9.541659-01	4	1	5	0	4.496989-01
3	2	3	0	6.577384-01	4	1	5	1	4.598723-01
3	2	3	1	6.918505-01	4	1	5	2	4.799663-01
3	2	3	2	7.709355-01	4	1	5	3	5.110728-01
3	2	4	0	4.239611-01	4	1	5	4	5.583702-01
3	2	4	1	4.415042-01	4	1	6	0	3.366152-01
3	2	4	2	4.784031-01	4	1	6	1	3.430853-01
3	2	4	3	5.318769-01	4	1	6	2	3.556132-01
3	2	5	0	2.901741-01	4	1	6	3	3.740658-01
3	2	5	1	2.996632-01	4	1	6	4	3.986942-01
3	2	5	2	3.184067-01	4	1	6	5	4.302552-01
3	2	5	3	3.420261-01	4	2	1	0	1.000000+00
3	2	5	4	3.599934-01	4	2	2	0	9.382856-01
3	2	6	0	2.099087-01	4	2	2	1	9.601397-01
3	2	6	1	2.155418-01	4	2	3	0	7.972406-01
3	2	6	2	2.263077-01	4	2	3	1	8.142848-01
3	2	6	3	2.391748-01	4	2	3	2	8.504936-01
3	2	6	4	2.491865-01	4	2	4	0	6.313035-01
3	2	6	5	2.500000-01	4	2	4	1	6.478871-01
4	0	1	0	9.177780-01	4	2	4	2	6.816032-01
4	0	2	0	8.200005-01	4	2	4	3	7.247277-01
4	0	2	1	8.367109-01	4	2	5	0	4.592739-01
4	0	3	0	7.176146-01	4	2	5	1	4.701559-01
4	0	3	1	7.301387-01	4	2	5	2	4.924126-01
4	0	3	2	7.537064-01	4	2	5	3	5.256482-01
4	0	4	0	5.963016-01	4	2	5	4	5.747268-01
4	0	4	1	6.084980-01	4	2	6	0	3.417883-01
4	0	4	2	6.313064-01	4	2	6	1	3.486135-01
4	0	4	3	6.632725-01	4	2	6	2	3.622204-01
4	0	5	0	4.446968-01	4	2	6	3	3.815275-01
4	0	5	1	4.543481-01	4	2	6	4	4.062823-01
4	0	5	2	4.737574-01	4	2	6	5	4.357768-01
4	0	5	3	5.041380-01	4	3	1	0	1.000000+00
4	0	5	4	5.505341-01	4	3	2	0	1.000000+00
4	0	6	0	3.338970-01	4	3	2	1	1.000000+00
4	0	6	1	3.400997-01	4	3	3	0	8.861498-01
4	0	6	2	3.523178-01	4	3	3	1	9.044000-01
4	0	6	3	3.705374-01	4	3	3	2	9.455559-01
4	0	6	4	3.951323-01	4	3	4	0	6.632665-01
4	0	6	5	4.274636-01	4	3	4	1	6.825000-01
4	1	1	0	9.844620-01	4	3	4	2	7.247263-01
4	1	2	0	8.634605-01	4	3	4	3	8.005491-01
4	1	2	1	8.852617-01	4	3	5	0	4.730072-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
4	3	5	1	4.846748-01	5	1	6	4	5.469867-01
4	3	5	2	5.091642-01	5	1	6	5	5.889421-01
4	3	5	3	5.489318-01	5	2	1	0	1.000000+00
4	3	5	4	6.027307-01	5	2	2	0	9.500160-01
4	3	6	0	3.492154-01	5	2	2	1	9.668468-01
4	3	6	1	3.564164-01	5	2	3	0	8.462470-01
4	3	6	2	3.710620-01	5	2	3	1	8.585385-01
4	3	6	3	3.932906-01	5	2	3	2	8.844489-01
4	3	6	4	4.197241-01	5	2	4	0	7.402493-01
4	3	6	5	4.432126-01	5	2	4	1	7.499475-01
5	0	1	0	9.343818-01	5	2	4	2	7.693908-01
5	0	2	0	8.572347-01	5	2	4	3	7.955659-01
5	0	2	1	8.702979-01	5	2	5	0	6.185863-01
5	0	3	0	7.789753-01	5	2	5	1	6.284119-01
5	0	3	1	7.883859-01	5	2	5	2	6.478452-01
5	0	3	2	8.060508-01	5	2	5	3	6.737562-01
5	0	4	0	6.948404-01	5	2	5	4	7.052505-01
5	0	4	1	7.026542-01	5	2	6	0	4.827138-01
5	0	4	2	7.176099-01	5	2	6	1	4.900850-01
5	0	4	3	7.390558-01	5	2	6	2	5.049816-01
5	0	5	0	5.957299-01	5	2	6	3	5.271602-01
5	0	5	1	6.036131-01	5	2	6	4	5.579219-01
5	0	5	2	6.185858-01	5	2	6	5	6.018800-01
5	0	5	3	6.398533-01	5	3	1	0	1.000000+00
5	0	5	4	6.667297-01	5	3	2	0	9.981548-01
5	0	6	0	4.718049-01	5	3	2	1	1.000000+00
5	0	6	1	4.785337-01	5	3	3	0	9.097974-01
5	0	6	2	4.920112-01	5	3	3	1	9.219397-01
5	0	6	3	5.126301-01	5	3	3	2	9.500774-01
5	0	6	4	5.416722-01	5	3	4	0	7.877159-01
5	0	6	5	5.825238-01	5	3	4	1	7.985542-01
5	1	1	0	9.873155-01	5	3	4	2	8.213261-01
5	1	2	0	8.925693-01	5	3	4	3	8.577081-01
5	1	2	1	9.094647-01	5	3	5	0	6.398501-01
5	1	3	0	8.019657-01	5	3	5	1	6.508936-01
5	1	3	1	8.128725-01	5	3	5	2	6.737554-01
5	1	3	2	8.324102-01	5	3	5	3	7.091536-01
5	1	4	0	7.099199-01	5	3	5	4	7.493775-01
5	1	4	1	7.185434-01	5	3	6	0	4.931302-01
5	1	4	2	7.346103-01	5	3	6	1	5.009252-01
5	1	4	3	7.572959-01	5	3	6	2	5.169395-01
5	1	5	0	6.036127-01	5	3	6	3	5.418709-01
5	1	5	1	6.123224-01	5	3	6	4	5.752982-01
5	1	5	2	6.284100-01	5	3	6	5	6.220772-01
5	1	5	3	6.508900-01	5	4	1	0	1.000000+00
5	1	5	4	6.790677-01	5	4	2	0	1.000000+00
5	1	6	0	4.755272-01	5	4	2	1	1.000000+00
5	1	6	1	4.825191-01	5	4	3	0	9.854155-01
5	1	6	2	4.963635-01	5	4	3	1	9.917657-01
5	1	6	3	5.174188-01	5	4	3	2	9.999813-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
5	4	4	0	8.602073-01	6	1	5	4	7.413030-01
5	4	4	1	8.724524-01	6	1	6	0	6.009297-01
5	4	4	2	8.980139-01	6	1	6	1	6.068588-01
5	4	4	3	9.417687-01	6	1	6	2	6.180116-01
5	4	5	0	6.667360-01	6	1	6	3	6.338176-01
5	4	5	1	6.790654-01	6	1	6	4	6.538387-01
5	4	5	2	7.052509-01	6	1	6	5	6.776880-01
5	4	5	3	7.493786-01	6	2	1	0	1.000000+00
5	4	5	4	8.210312-01	6	2	2	0	9.581303-01
5	4	6	0	5.065166-01	6	2	2	1	9.718960-01
5	4	6	1	5.147913-01	6	2	3	0	8.748880-01
5	4	6	2	5.319627-01	6	2	3	1	8.846790-01
5	4	6	3	5.594512-01	6	2	3	2	9.052078-01
5	4	6	4	5.998697-01	6	2	4	0	7.927128-01
5	4	6	5	6.528430-01	6	2	4	1	8.001317-01
6	0	1	0	9.453912-01	6	2	4	2	8.149883-01
6	0	2	0	8.815647-01	6	2	4	3	8.349001-01
6	0	2	1	8.923215-01	6	2	5	0	7.084937-01
6	0	3	0	8.177737-01	6	2	5	1	7.147664-01
6	0	3	1	8.253896-01	6	2	5	2	7.271750-01
6	0	3	2	8.396596-01	6	2	5	3	7.443972-01
6	0	4	0	7.512707-01	6	2	5	4	7.660230-01
6	0	4	1	7.573691-01	6	2	6	0	6.115031-01
6	0	4	2	7.690233-01	6	2	6	1	6.180116-01
6	0	4	3	7.857237-01	6	2	6	2	6.307990-01
6	0	5	0	6.794006-01	6	2	6	3	6.483068-01
6	0	5	1	6.847568-01	6	2	6	4	6.700112-01
6	0	5	2	6.951161-01	6	2	6	5	6.955898-01
6	0	5	3	7.101057-01	6	3	1	0	1.000000+00
6	0	5	4	7.293831-01	6	3	2	0	9.970419-01
6	0	6	0	5.954196-01	6	3	2	1	9.999940-01
6	0	6	1	6.009288-01	6	3	3	0	9.250574-01
6	0	6	2	6.115021-01	6	3	3	1	9.345605-01
6	0	6	3	6.266648-01	6	3	3	2	9.567016-01
6	0	6	4	6.459870-01	6	3	4	0	8.336991-01
6	0	6	5	6.690951-01	6	3	4	1	8.416541-01
6	1	1	0	9.893210-01	6	3	4	2	8.584403-01
6	1	2	0	9.112362-01	6	3	4	3	8.848955-01
6	1	2	1	9.250884-01	6	3	5	0	7.381881-01
6	1	3	0	8.376712-01	6	3	5	1	7.450795-01
6	1	3	1	8.464679-01	6	3	5	2	7.591103-01
6	1	3	2	8.621793-01	6	3	5	3	7.802938-01
6	1	4	0	7.652250-01	6	3	5	4	8.056084-01
6	1	4	1	7.719304-01	6	3	6	0	6.266663-01
6	1	4	2	7.843836-01	6	3	6	1	6.338158-01
6	1	4	3	8.019417-01	6	3	6	2	6.483052-01
6	1	5	0	6.890919-01	6	3	6	3	6.699494-01
6	1	5	1	6.948288-01	6	3	6	4	6.954809-01
6	1	5	2	7.057269-01	6	3	6	5	7.245700-01
6	1	5	3	7.213348-01	6	4	1	0	1.000000+00

N(1)	L(1)	N(2)	L(2)	SIGMA
6	4	2	0	1.000000+00
6	4	2	1	1.000000+00
6	4	3	0	9.784999-01
6	4	3	1	9.847803-01
6	4	3	2	9.967494-01
6	4	4	0	8.890554-01
6	4	4	1	8.970638-01
6	4	4	2	9.141335-01
6	4	4	3	9.443708-01
6	4	5	0	7.800126-01
6	4	5	1	7.876610-01
6	4	5	2	8.034080-01
6	4	5	3	8.284294-01
6	4	5	4	8.638138-01
6	4	6	0	6.459865-01
6	4	6	1	6.538420-01
6	4	6	2	6.700085-01
6	4	6	3	6.954823-01
6	4	6	4	7.308677-01
6	4	6	5	7.685659-01
6	5	1	0	1.000000+00
6	5	2	0	1.000000+00
6	5	2	1	1.000000+00
6	5	3	0	1.000000+00
6	5	3	1	1.000000+00
6	5	3	2	1.000000+00
6	5	4	0	9.617954-01
6	5	4	1	9.680738-01
6	5	4	2	9.804950-01
6	5	4	3	9.972286-01
6	5	5	0	8.388358-01
6	5	5	1	8.480815-01
6	5	5	2	8.667096-01
6	5	5	3	8.957912-01
6	5	5	4	9.400938-01
6	5	6	0	6.690879-01
6	5	6	1	6.776847-01
6	5	6	2	6.955952-01
6	5	6	3	7.245653-01
6	5	6	4	7.685692-01
6	5	6	5	8.362758-01
7	0	1	0	9.532315-01
7	0	2	0	8.987551-01
7	0	2	1	9.079109-01
7	0	3	0	8.447614-01
7	0	3	1	8.511828-01
7	0	3	2	8.632009-01
7	0	4	0	7.893257-01
7	0	4	1	7.943822-01
7	0	4	2	8.040324-01
7	0	4	3	8.178442-01
7	0	5	0	7.311304-01
7	0	5	1	7.354264-01
7	0	5	2	7.437269-01
7	0	5	3	7.557332-01
7	0	5	4	7.711803-01
7	0	6	0	6.681943-01
7	0	6	1	6.721020-01
7	0	6	2	6.797124-01
7	0	6	3	6.907953-01
7	0	6	4	7.051295-01
7	0	6	5	7.225101-01
7	1	1	0	9.907930-01
7	1	2	0	9.242969-01
7	1	2	1	9.360576-01
7	1	3	0	8.621655-01
7	1	3	1	8.695690-01
7	1	3	2	8.827685-01
7	1	4	0	8.019007-01
7	1	4	1	8.074514-01
7	1	4	2	8.177377-01
7	1	4	3	8.322172-01
7	1	5	0	7.404163-01
7	1	5	1	7.450082-01
7	1	5	2	7.537124-01
7	1	5	3	7.661668-01
7	1	5	4	7.821041-01
7	1	6	0	6.749142-01
7	1	6	1	6.790253-01
7	1	6	2	6.869312-01
7	1	6	3	6.983601-01
7	1	6	4	7.130857-01
7	1	6	5	7.308957-01
7	2	1	0	1.000000+00
7	2	2	0	9.640138-01
7	2	2	1	9.756873-01
7	2	3	0	8.941546-01
7	2	3	1	9.023430-01
7	2	3	2	9.194540-01
7	2	4	0	8.262872-01
7	2	4	1	8.323842-01
7	2	4	2	8.445758-01
7	2	4	3	8.608648-01
7	2	5	0	7.588338-01
7	2	5	1	7.638085-01
7	2	5	2	7.736475-01
7	2	5	3	7.872637-01
7	2	5	4	8.043573-01
7	2	6	0	6.883337-01
7	2	6	1	6.927412-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
7	2	6	2	7.014358-01	7	5	3	1	1.000000+00
7	2	6	3	7.137283-01	7	5	3	2	1.000000+00
7	2	6	4	7.293593-01	7	5	4	0	9.573249-01
7	2	6	5	7.481371-01	7	5	4	1	9.625398-01
7	3	1	0	1.000000+00	7	5	4	2	9.733299-01
7	3	2	0	9.967366-01	7	5	4	3	9.906742-01
7	3	2	1	9.998892-01	7	5	5	0	8.729336-01
7	3	3	0	9.358813-01	7	5	5	1	8.787191-01
7	3	3	1	9.437745-01	7	5	5	2	8.907159-01
7	3	3	2	9.621922-01	7	5	5	3	9.101321-01
7	3	4	0	8.615023-01	7	5	5	4	9.409095-01
7	3	4	1	8.679387-01	7	5	6	0	7.732821-01
7	3	4	2	8.815308-01	7	5	6	1	7.790764-01
7	3	4	3	9.027502-01	7	5	6	2	7.908588-01
7	3	5	0	7.864687-01	7	5	6	3	8.091236-01
7	3	5	1	7.918137-01	7	5	6	4	8.349925-01
7	3	5	2	8.027237-01	7	5	6	5	8.690777-01
7	3	5	3	8.191579-01	8	0	1	0	9.591017-01
7	3	5	4	8.387269-01	8	0	2	0	9.115629-01
7	3	6	0	7.086589-01	8	0	2	1	9.195386-01
7	3	6	1	7.134198-01	8	0	3	0	8.646905-01
7	3	6	2	7.229925-01	8	0	3	1	8.702521-01
7	3	6	3	7.372179-01	8	0	3	2	8.806529-01
7	3	6	4	7.547080-01	8	0	4	0	8.169950-01
7	3	6	5	7.753091-01	8	0	4	1	8.213329-01
7	4	1	0	1.000000+00	8	0	4	2	8.296042-01
7	4	2	0	1.000000+00	8	0	4	3	8.414314-01
7	4	2	1	1.000000+00	8	0	5	0	7.676702-01
7	4	3	0	9.784289-01	8	0	5	1	7.712975-01
7	4	3	1	9.839606-01	8	0	5	2	7.782989-01
7	4	3	2	9.952088-01	8	0	5	3	7.884169-01
7	4	4	0	9.061814-01	8	0	5	4	8.014255-01
7	4	4	1	9.125210-01	8	0	6	0	7.157607-01
7	4	4	2	9.260811-01	8	0	6	1	7.189608-01
7	4	4	3	9.501909-01	8	0	6	2	7.251889-01
7	4	5	0	8.239116-01	8	0	6	3	7.342575-01
7	4	5	1	8.295685-01	8	0	6	4	7.459919-01
7	4	5	2	8.412704-01	8	0	6	5	7.602354-01
7	4	5	3	8.599776-01	8	1	1	0	9.919162-01
7	4	5	4	8.859322-01	8	1	2	0	9.339708-01
7	4	6	0	7.365153-01	8	1	2	1	9.441997-01
7	4	6	1	7.417075-01	8	1	3	0	8.801075-01
7	4	6	2	7.522448-01	8	1	3	1	8.865124-01
7	4	6	3	7.684157-01	8	1	3	2	8.979184-01
7	4	6	4	7.901313-01	8	1	4	0	8.283193-01
7	4	6	5	8.144386-01	8	1	4	1	8.330771-01
7	5	1	0	1.000000+00	8	1	4	2	8.418813-01
7	5	2	0	1.000000+00	8	1	4	3	8.542596-01
7	5	2	1	1.000000+00	8	1	5	0	7.762750-01
7	5	3	0	1.000000+00	8	1	5	1	7.801487-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
8	1	5	2	7.874795-01	8	3	6	5	8.086067-01
8	1	5	3	7.979559-01	8	4	1	0	1.000000+00
8	1	5	4	8.113503-01	8	4	2	0	1.000000+00
8	1	6	0	7.223492-01	8	4	2	1	1.000000+00
8	1	6	1	7.257114-01	8	4	3	0	9.796779-01
8	1	6	2	7.321675-01	8	4	3	1	9.845561-01
8	1	6	3	7.414956-01	8	4	3	2	9.947468-01
8	1	6	4	7.535180-01	8	4	4	0	9.184883-01
8	1	6	5	7.680732-01	8	4	4	1	9.238131-01
8	2	1	0	1.000000+00	8	4	4	2	9.352073-01
8	2	2	0	9.684612-01	8	4	4	3	9.554833-01
8	2	2	1	9.786074-01	8	4	5	0	8.508559-01
8	2	3	0	9.081280-01	8	4	5	1	8.554834-01
8	2	3	1	9.151852-01	8	4	5	2	8.650634-01
8	2	3	2	9.299012-01	8	4	5	3	8.803855-01
8	2	4	0	8.500479-01	8	4	5	4	9.013497-01
8	2	4	1	8.552527-01	8	4	6	0	7.816695-01
8	2	4	2	8.656488-01	8	4	6	1	7.857288-01
8	2	4	3	8.795108-01	8	4	6	2	7.939872-01
8	2	5	0	7.931898-01	8	4	6	3	8.067074-01
8	2	5	1	7.973683-01	8	4	6	4	8.237212-01
8	2	5	2	8.056266-01	8	4	6	5	8.427206-01
8	2	5	3	8.170282-01	8	5	1	0	1.000000+00
8	2	5	4	8.313252-01	8	5	2	0	1.000000+00
8	2	6	0	7.354506-01	8	5	2	1	1.000000+00
8	2	6	1	7.390347-01	8	5	3	0	9.998925-01
8	2	6	2	7.461042-01	8	5	3	1	1.000000+00
8	2	6	3	7.560798-01	8	5	3	2	1.000000+00
8	2	6	4	7.687628-01	8	5	4	0	9.593918-01
8	2	6	5	7.840124-01	8	5	4	1	9.638466-01
8	3	1	0	1.000000+00	8	5	4	2	9.731697-01
8	3	2	0	9.967422-01	8	5	4	3	9.887587-01
8	3	2	1	9.997971-01	8	5	5	0	8.912298-01
8	3	3	0	9.439665-01	8	5	5	1	8.958390-01
8	3	3	1	9.507458-01	8	5	5	2	9.054246-01
8	3	3	2	9.665729-01	8	5	5	3	9.209969-01
8	3	4	0	8.807931-01	8	5	5	4	9.457428-01
8	3	4	1	8.862444-01	8	5	6	0	8.159044-01
8	3	4	2	8.977566-01	8	5	6	1	8.201802-01
8	3	4	3	9.156184-01	8	5	6	2	8.289266-01
8	3	5	0	8.181247-01	8	5	6	3	8.426098-01
8	3	5	1	8.225709-01	8	5	6	4	8.621412-01
8	3	5	2	8.316508-01	8	5	6	5	8.872615-01
8	3	5	3	8.452865-01	9	0	1	0	9.636616-01
8	3	5	4	8.614779-01	9	0	2	0	9.214813-01
8	3	6	0	7.551197-01	9	0	2	1	9.285496-01
8	3	6	1	7.589403-01	9	0	3	0	8.800377-01
8	3	6	2	7.666334-01	9	0	3	1	8.849477-01
8	3	6	3	7.780614-01	9	0	3	2	8.941249-01
8	3	6	4	7.920794-01	9	0	4	0	8.381080-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
9	0	4	1	8.419149-01	9	2	6	0	7.691149-01
9	0	4	2	8.491687-01	9	2	6	1	7.721745-01
9	0	4	3	8.595339-01	9	2	6	2	7.782061-01
9	0	5	0	7.951365-01	9	2	6	3	7.867019-01
9	0	5	1	7.982903-01	9	2	6	4	7.974931-01
9	0	5	2	8.043731-01	9	2	6	5	8.104611-01
9	0	5	3	8.131570-01	9	3	1	0	1.000000+00
9	0	5	4	8.244426-01	9	3	2	0	9.968656-01
9	0	6	0	7.505628-01	9	3	2	1	9.997428-01
9	0	6	1	7.533035-01	9	3	3	0	9.502362-01
9	0	6	2	7.586334-01	9	3	3	1	9.561903-01
9	0	6	3	7.663888-01	9	3	3	2	9.700927-01
9	0	6	4	7.764187-01	9	3	4	0	8.951425-01
9	0	6	5	7.885897-01	9	3	4	1	8.998894-01
9	1	1	0	9.927997-01	9	3	4	2	9.099127-01
9	1	2	0	9.414351-01	9	3	4	3	9.253990-01
9	1	2	1	9.504900-01	9	3	5	0	8.410167-01
9	1	3	0	8.938525-01	9	3	5	1	8.448499-01
9	1	3	1	8.995028-01	9	3	5	2	8.526783-01
9	1	3	2	9.095571-01	9	3	5	3	8.644076-01
9	1	4	0	8.483605-01	9	3	5	4	8.783091-01
9	1	4	1	8.525332-01	9	3	6	0	7.874227-01
9	1	4	2	8.602475-01	9	3	6	1	7.906640-01
9	1	4	3	8.710844-01	9	3	6	2	7.971916-01
9	1	5	0	8.030548-01	9	3	6	3	8.068756-01
9	1	5	1	8.064212-01	9	3	6	4	8.187278-01
9	1	5	2	8.127846-01	9	3	6	5	8.326935-01
9	1	5	3	8.218698-01	9	4	1	0	1.000000+00
9	1	5	4	8.334760-01	9	4	2	0	1.000000+00
9	1	6	0	7.567927-01	9	4	2	1	1.000000+00
9	1	6	1	7.596707-01	9	4	3	0	9.811535-01
9	1	6	2	7.651902-01	9	4	3	1	9.855056-01
9	1	6	3	7.731573-01	9	4	3	2	9.947211-01
9	1	6	4	7.834191-01	9	4	4	0	9.278649-01
9	1	6	5	7.958380-01	9	4	4	1	9.324790-01
9	2	1	0	1.000000+00	9	4	4	2	9.423603-01
9	2	2	0	9.719366-01	9	4	4	3	9.599406-01
9	2	2	1	9.809144-01	9	4	5	0	8.699361-01
9	2	3	0	9.187711-01	9	4	5	1	8.738936-01
9	2	3	1	9.249816-01	9	4	5	2	8.820824-01
9	2	3	2	9.379132-01	9	4	5	3	8.951792-01
9	2	4	0	8.678864-01	9	4	5	4	9.129312-01
9	2	4	1	8.724397-01	9	4	6	0	8.117022-01
9	2	4	2	8.815274-01	9	4	6	1	8.151075-01
9	2	4	3	8.936281-01	9	4	6	2	8.220400-01
9	2	5	0	8.185152-01	9	4	6	3	8.327233-01
9	2	5	1	8.221372-01	9	4	6	4	8.469441-01
9	2	5	2	8.292913-01	9	4	6	5	8.627911-01
9	2	5	3	8.391522-01	9	5	1	0	1.000000+00
9	2	5	4	8.515050-01	9	5	2	0	1.000000+00

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
9	5	2	1	1.000000+00	10	1	5	0	8.239261-01
9	5	3	0	9.995254-01	10	1	5	1	8.269103-01
9	5	3	1	9.999996-01	10	1	5	2	8.325466-01
9	5	3	2	1.000000+00	10	1	5	3	8.405878-01
9	5	4	0	9.623798-01	10	1	5	4	8.508537-01
9	5	4	1	9.662751-01	10	1	6	0	7.832419-01
9	5	4	2	9.744721-01	10	1	6	1	7.857705-01
9	5	4	3	9.884174-01	10	1	6	2	7.906153-01
9	5	5	0	9.044105-01	10	1	6	3	7.976031-01
9	5	5	1	9.083113-01	10	1	6	4	8.065974-01
9	5	5	2	9.164210-01	10	1	6	5	8.174766-01
9	5	5	3	9.296263-01	10	2	1	0	1.000000+00
9	5	5	4	9.505819-01	10	2	2	0	9.747256-01
9	5	6	0	8.420879-01	10	2	2	1	9.827804-01
9	5	6	1	8.456097-01	10	2	3	0	9.271667-01
9	5	6	2	8.528231-01	10	2	3	1	9.327171-01
9	5	6	3	8.641205-01	10	2	3	2	9.442624-01
9	5	6	4	8.802516-01	10	2	4	0	8.818272-01
9	5	6	5	9.006222-01	10	2	4	1	8.858806-01
10	0	1	0	9.673081-01	10	2	4	2	8.939654-01
10	0	2	0	9.293932-01	10	2	4	3	9.047207-01
10	0	2	1	9.357408-01	10	2	5	0	8.380909-01
10	0	3	0	8.922326-01	10	2	5	1	8.412962-01
10	0	3	1	8.966303-01	10	2	5	2	8.476245-01
10	0	3	2	9.048469-01	10	2	5	3	8.563370-01
10	0	4	0	8.547849-01	10	2	5	4	8.672430-01
10	0	4	1	8.581808-01	10	2	6	0	7.947190-01
10	0	4	2	8.646486-01	10	2	6	1	7.974026-01
10	0	4	3	8.738859-01	10	2	6	2	8.026905-01
10	0	5	0	8.166346-01	10	2	6	3	8.101291-01
10	0	5	1	8.194311-01	10	2	6	4	8.195691-01
10	0	5	2	8.248221-01	10	2	6	5	8.309059-01
10	0	5	3	8.326023-01	10	3	1	0	1.000000+00
10	0	5	4	8.425925-01	10	3	2	0	9.970276-01
10	0	6	0	7.774134-01	10	3	2	1	9.997144-01
10	0	6	1	7.798220-01	10	3	3	0	9.552414-01
10	0	6	2	7.845032-01	10	3	3	1	9.605554-01
10	0	6	3	7.913104-01	10	3	3	2	9.729650-01
10	0	6	4	8.001091-01	10	3	4	0	9.062998-01
10	0	6	5	8.107808-01	10	3	4	1	9.105126-01
10	1	1	0	9.935118-01	10	3	4	2	9.194071-01
10	1	2	0	9.473730-01	10	3	4	3	9.331084-01
10	1	2	1	9.554991-01	10	3	5	0	8.585168-01
10	1	3	0	9.047359-01	10	3	5	1	8.618976-01
10	1	3	1	9.097940-01	10	3	5	2	8.688014-01
10	1	3	2	9.187898-01	10	3	5	3	8.791280-01
10	1	4	0	8.641280-01	10	3	5	4	8.913512-01
10	1	4	1	8.678489-01	10	3	6	0	8.116296-01
10	1	4	2	8.747231-01	10	3	6	1	8.144620-01
10	1	4	3	8.843740-01	10	3	6	2	8.201660-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
10	3	6	3	8.286189-01	11	0	3	2	9.135874-01
10	3	6	4	8.389473-01	11	0	4	0	8.683077-01
10	3	6	5	8.511093-01	11	0	4	1	8.713753-01
10	4	1	0	1.000000+00	11	0	4	2	8.772156-01
10	4	2	0	1.000000+00	11	0	4	3	8.855535-01
10	4	2	1	1.000000+00	11	0	5	0	8.339619-01
10	4	3	0	9.825741-01	11	0	5	1	8.364776-01
10	4	3	1	9.864951-01	11	0	5	2	8.413251-01
10	4	3	2	9.948738-01	11	0	5	3	8.483179-01
10	4	4	0	9.352735-01	11	0	5	4	8.572930-01
10	4	4	1	9.393547-01	11	0	6	0	7.988628-01
10	4	4	2	9.481043-01	11	0	6	1	8.010167-01
10	4	4	3	9.636619-01	11	0	6	2	8.052012-01
10	4	5	0	8.843909-01	11	0	6	3	8.112828-01
10	4	5	1	8.878639-01	11	0	6	4	8.191400-01
10	4	5	2	8.950495-01	11	0	6	5	8.286654-01
10	4	5	3	9.065380-01	11	1	1	0	9.940965-01
10	4	5	4	9.220081-01	11	1	2	0	9.522130-01
10	4	6	0	8.337561-01	11	1	2	1	9.595840-01
10	4	6	1	8.367132-01	11	1	3	0	9.135746-01
10	4	6	2	8.427346-01	11	1	3	1	9.181552-01
10	4	6	3	8.520129-01	11	1	3	2	9.262982-01
10	4	6	4	8.643193-01	11	1	4	0	8.768775-01
10	4	6	5	8.780130-01	11	1	4	1	8.802378-01
10	5	1	0	1.000000+00	11	1	4	2	8.864423-01
10	5	2	0	1.000000+00	11	1	4	3	8.951490-01
10	5	2	1	1.000000+00	11	1	5	0	8.406977-01
10	5	3	0	9.992392-01	11	1	5	1	8.433816-01
10	5	3	1	9.999291-01	11	1	5	2	8.484478-01
10	5	3	2	1.000000+00	11	1	5	3	8.556717-01
10	5	4	0	9.653056-01	11	1	5	4	8.648894-01
10	5	4	1	9.687732-01	11	1	6	0	8.043028-01
10	5	4	2	9.760913-01	11	1	6	1	8.065637-01
10	5	4	3	9.886562-01	11	1	6	2	8.108927-01
10	5	5	0	9.145787-01	11	1	6	3	8.171325-01
10	5	5	1	9.179792-01	11	1	6	4	8.251598-01
10	5	5	2	9.250605-01	11	1	6	5	8.348644-01
10	5	5	3	9.365970-01	11	2	1	0	1.000000+00
10	5	5	4	9.548728-01	11	2	2	0	9.770129-01
10	5	6	0	8.608708-01	11	2	2	1	9.843175-01
10	5	6	1	8.639020-01	11	2	3	0	9.339681-01
10	5	6	2	8.701132-01	11	2	3	1	9.389883-01
10	5	6	3	8.798407-01	11	2	3	2	9.494225-01
10	5	6	4	8.937202-01	11	2	4	0	8.930477-01
10	5	6	5	9.110324-01	11	2	4	1	8.967037-01
11	0	1	0	9.702918-01	11	2	4	2	9.039925-01
11	0	2	0	9.358524-01	11	2	4	3	9.136822-01
11	0	2	1	9.416136-01	11	2	5	0	8.537331-01
11	0	3	0	9.021621-01	11	2	5	1	8.566126-01
11	0	3	1	9.061461-01	11	2	5	2	8.622955-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
11	2	5	3	8.701126-01	11	5	1	0	1.000000+00
11	2	5	4	8.798925-01	11	5	2	0	1.000000+00
11	2	6	0	8.149773-01	11	5	2	1	1.000000+00
11	2	6	1	8.173742-01	11	5	3	0	9.990595-01
11	2	6	2	8.220954-01	11	5	3	1	9.998381-01
11	2	6	3	8.287299-01	11	5	3	2	1.000000+00
11	2	6	4	8.371441-01	11	5	4	0	9.679545-01
11	2	6	5	8.472430-01	11	5	4	1	9.710815-01
11	3	1	0	1.000000+00	11	5	4	2	9.776934-01
11	3	2	0	9.971975-01	11	5	4	3	9.891126-01
11	3	2	1	9.997023-01	11	5	5	0	9.227172-01
11	3	3	0	9.593303-01	11	5	5	1	9.257446-01
11	3	3	1	9.641317-01	11	5	5	2	9.320514-01
11	3	3	2	9.753468-01	11	5	5	3	9.423283-01
11	3	4	0	9.152521-01	11	5	5	4	9.585833-01
11	3	4	1	9.190442-01	11	5	6	0	8.752899-01
11	3	4	2	9.270486-01	11	5	6	1	8.779647-01
11	3	4	3	9.393522-01	11	5	6	2	8.834476-01
11	3	5	0	8.724023-01	11	5	6	3	8.920361-01
11	3	5	1	8.754324-01	11	5	6	4	9.042787-01
11	3	5	2	8.816192-01	11	5	6	5	9.194161-01
11	3	5	3	8.908618-01	12	0	1	0	9.727739-01
11	3	5	4	9.017919-01	12	0	2	0	9.412266-01
11	3	6	0	8.306047-01	12	0	2	1	9.465014-01
11	3	6	1	8.331283-01	12	0	3	0	9.104071-01
11	3	6	2	8.382098-01	12	0	3	1	9.140491-01
11	3	6	3	8.457337-01	12	0	3	2	9.208510-01
11	3	6	4	8.549158-01	12	0	4	0	8.795030-01
11	3	6	5	8.657221-01	12	0	4	1	8.823013-01
11	4	1	0	1.000000+00	12	0	4	2	8.876283-01
11	4	2	0	1.000000+00	12	0	4	3	8.952305-01
11	4	2	1	1.000000+00	12	0	5	0	8.482460-01
11	4	3	0	9.838629-01	12	0	5	1	8.505342-01
11	4	3	1	9.874297-01	12	0	5	2	8.549419-01
11	4	3	2	9.950950-01	12	0	5	3	8.612981-01
11	4	4	0	9.412833-01	12	0	5	4	8.694533-01
11	4	4	1	9.449493-01	12	0	6	0	8.164388-01
11	4	4	2	9.528120-01	12	0	6	1	8.183900-01
11	4	4	3	9.667862-01	12	0	6	2	8.221789-01
11	4	5	0	8.958074-01	12	0	6	3	8.276837-01
11	4	5	1	8.989091-01	12	0	6	4	8.347928-01
11	4	5	2	9.053282-01	12	0	6	5	8.434079-01
11	4	5	3	9.155867-01	12	1	1	0	9.945899-01
11	4	5	4	9.293352-01	12	1	2	0	9.562335-01
11	4	6	0	8.508478-01	12	1	2	1	9.629798-01
11	4	6	1	8.534721-01	12	1	3	0	9.209002-01
11	4	6	2	8.588156-01	12	1	3	1	9.250872-01
11	4	6	3	8.670481-01	12	1	3	2	9.325273-01
11	4	6	4	8.779378-01	12	1	4	0	8.874111-01
11	4	6	5	8.900431-01	12	1	4	1	8.904760-01

N(1)	L(1)	N(2)	L(2)	SIGMA
12	1	4	2	8.961329-01
12	1	4	3	9.040686-01
12	1	5	0	8.544933-01
12	1	5	1	8.569342-01
12	1	5	2	8.615394-01
12	1	5	3	8.681033-01
12	1	5	4	8.764756-01
12	1	6	0	8.215207-01
12	1	6	1	8.235684-01
12	1	6	2	8.274872-01
12	1	6	3	8.331330-01
12	1	6	4	8.403931-01
12	1	6	5	8.491665-01
12	2	1	0	1.000000+00
12	2	2	0	9.789215-01
12	2	2	1	9.856064-01
12	2	3	0	9.395947-01
12	2	3	1	9.441792-01
12	2	3	2	9.537023-01
12	2	4	0	9.022871-01
12	2	4	1	9.056186-01
12	2	4	2	9.122588-01
12	2	4	3	9.210812-01
12	2	5	0	8.665480-01
12	2	5	1	8.691646-01
12	2	5	2	8.743270-01
12	2	5	3	8.814235-01
12	2	5	4	8.902980-01
12	2	6	0	8.314646-01
12	2	6	1	8.336337-01
12	2	6	2	8.379050-01
12	2	6	3	8.439032-01
12	2	6	4	8.515062-01
12	2	6	5	8.606270-01
12	3	1	0	1.000000+00
12	3	2	0	9.973631-01
12	3	2	1	9.997003-01
12	3	3	0	9.627336-01
12	3	3	1	9.671153-01
12	3	3	2	9.773500-01
12	3	4	0	9.226089-01
12	3	4	1	9.260593-01
12	3	4	2	9.333417-01
12	3	4	3	9.445172-01
12	3	5	0	8.837233-01
12	3	5	1	8.864718-01
12	3	5	2	8.920838-01
12	3	5	3	9.004594-01
12	3	5	4	9.103573-01
12	3	6	0	8.459499-01
12	3	6	1	8.482298-01
12	3	6	2	8.528201-01
12	3	6	3	8.596124-01
12	3	6	4	8.678939-01
12	3	6	5	8.776361-01
12	4	1	0	1.000000+00
12	4	2	0	1.000000+00
12	4	2	1	1.000000+00
12	4	3	0	9.850104-01
12	4	3	1	9.882802-01
12	4	3	2	9.953371-01
12	4	4	0	9.462614-01
12	4	4	1	9.495926-01
12	4	4	2	9.567387-01
12	4	4	3	9.694354-01
12	4	5	0	9.050907-01
12	4	5	1	9.078975-01
12	4	5	2	9.137075-01
12	4	5	3	9.229883-01
12	4	5	4	9.353836-01
12	4	6	0	8.645718-01
12	4	6	1	8.669363-01
12	4	6	2	8.717505-01
12	4	6	3	8.791665-01
12	4	6	4	8.889557-01
12	4	6	5	8.998300-01
12	5	1	0	1.000000+00
12	5	2	0	1.000000+00
12	5	2	1	1.000000+00
12	5	3	0	9.989539-01
12	5	3	1	9.997643-01
12	5	3	2	1.000000+00
12	5	4	0	9.702996-01
12	5	4	1	9.731489-01
12	5	4	2	9.791811-01
12	5	4	3	9.896398-01
12	5	5	0	9.294026-01
12	5	5	1	9.321371-01
12	5	5	2	9.378340-01
12	5	5	3	9.471179-01
12	5	5	4	9.617814-01
12	5	6	0	8.868155-01
12	5	6	1	8.892165-01
12	5	6	2	8.941388-01
12	5	6	3	9.018500-01
12	5	6	4	9.128345-01
12	5	6	5	9.263285-01
13	0	1	0	9.748778-01
13	0	2	0	9.457691-01
13	0	2	1	9.506335-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
13	0	3	0	9.173647-01	13	2	5	1	8.796532-01
13	0	3	1	9.207196-01	13	2	5	2	8.843857-01
13	0	3	2	9.269844-01	13	2	5	3	8.908882-01
13	0	4	0	8.889291-01	13	2	5	4	8.990169-01
13	0	4	1	8.915029-01	13	2	6	0	8.451739-01
13	0	4	2	8.964009-01	13	2	6	1	8.471571-01
13	0	4	3	9.033896-01	13	2	6	2	8.510612-01
13	0	5	0	8.602350-01	13	2	6	3	8.565405-01
13	0	5	1	8.623348-01	13	2	6	4	8.634830-01
13	0	5	2	8.663785-01	13	2	6	5	8.718085-01
13	0	5	3	8.722082-01	13	3	1	0	1.000000+00
13	0	5	4	8.796856-01	13	3	2	0	9.975164-01
13	0	6	0	8.311279-01	13	3	2	1	9.997035-01
13	0	6	1	8.329129-01	13	3	3	0	9.656108-01
13	0	6	2	8.363783-01	13	3	3	1	9.696407-01
13	0	6	3	8.414115-01	13	3	3	2	9.790561-01
13	0	6	4	8.479094-01	13	3	4	0	9.287691-01
13	0	6	5	8.557813-01	13	3	4	1	9.319361-01
13	1	1	0	9.950066-01	13	3	4	2	9.386198-01
13	1	2	0	9.596283-01	13	3	4	3	9.488636-01
13	1	2	1	9.658482-01	13	3	5	0	8.931484-01
13	1	3	0	9.270733-01	13	3	5	1	8.956656-01
13	1	3	1	9.309291-01	13	3	5	2	9.008043-01
13	1	3	2	9.37 797-01	13	3	5	3	9.084686-01
13	1	4	0	8.962658-01	13	3	5	4	9.175208-01
13	1	4	1	8.990844-01	13	3	6	0	8.586516-01
13	1	4	2	9.042847-01	13	3	6	1	8.607335-01
13	1	4	3	9.115777-01	13	3	6	2	8.649245-01
13	1	5	0	8.660534-01	13	3	6	3	8.711225-01
13	1	5	1	8.682929-01	13	3	6	4	8.786745-01
13	1	5	2	8.725168-01	13	3	6	5	8.875551-01
13	1	5	3	8.785352-01	13	4	1	0	1.000000+00
13	1	5	4	8.862095-01	13	4	2	0	1.000000+00
13	1	6	0	8.358853-01	13	4	2	1	1.000000+00
13	1	6	1	8.377586-01	13	4	3	0	9.860264-01
13	1	6	2	8.413420-01	13	4	3	1	9.890445-01
13	1	6	3	8.465027-01	13	4	3	2	9.955785-01
13	1	6	4	8.531366-01	13	4	4	0	9.504551-01
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13	2	1	0	1.000000+00	13	4	4	2	9.600634-01
13	2	2	0	9.805377-01	13	4	4	3	9.717045-01
13	2	2	1	9.867003-01	13	4	5	0	9.128073-01
13	2	3	0	9.443298-01	13	4	5	1	9.153729-01
13	2	3	1	9.485486-01	13	4	5	2	9.206849-01
13	2	3	2	9.573095-01	13	4	5	3	9.291671-01
13	2	4	0	9.100348-01	13	4	5	4	9.404660-01
13	2	4	1	9.130961-01	13	4	6	0	8.758772-01
13	2	4	2	9.191964-01	13	4	6	1	8.780322-01
13	2	4	3	9.272979-01	13	4	6	2	8.824190-01
13	2	5	0	8.772540-01	13	4	6	3	8.891760-01

N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
13	4	6	4	8.980806-01	14	1	4	0	9.038172-01
13	4	6	5	9.079675-01	14	1	4	1	9.064267-01
13	5	1	0	1.000000+00	14	1	4	2	9.112400-01
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13	5	3	0	9.988997-01	14	1	5	1	8.779575-01
13	5	3	1	9.997114-01	14	1	5	2	8.818604-01
13	5	3	2	1.000000+00	14	1	5	3	8.874197-01
13	5	4	0	9.723630-01	14	1	5	4	8.945068-01
13	5	4	1	9.749810-01	14	1	6	0	8.480662-01
13	5	4	2	9.805289-01	14	1	6	1	8.497936-01
13	5	4	3	9.901742-01	14	1	6	2	8.530968-01
13	5	5	0	9.350025-01	14	1	6	3	8.578528-01
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13	5	5	3	9.511773-01	14	2	1	0	1.000000+00
13	5	5	4	9.645496-01	14	2	2	0	9.819252-01
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13	5	6	3	9.099538-01	14	2	3	2	9.603927-01
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14	1	3	0	9.323476-01	14	3	5	1	9.034504-01
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N(1)	L(1)	N(2)	L(2)	SIGMA	N(1)	L(1)	N(2)	L(2)	SIGMA
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14	3	6	5	8.959524-01	15	0	4	1	9.061510-01
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14	5	3	2	1.000000+00	15	1	5	3	8.950805-01
14	5	4	0	9.741814-01	15	1	5	4	9.016662-01
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14	5	5	1	9.420649-01	15	1	6	4	8.732845-01
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15	0	1	0	9.782469-01	15	2	4	2	9.302011-01

N(1)	L(1)	N(2)	L(2)	SIGMA
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15	2	5	0	8.941558-01
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15	2	5	3	9.058554-01
15	2	5	4	9.128241-01
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15	2	6	3	8.764300-01
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15	3	1	0	1.000000+00
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15	3	5	1	9.101336-01
15	3	5	2	9.145379-01
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15	3	6	4	8.955958-01
15	3	6	5	9.031596-01
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15	4	3	1	9.903403-01
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15	4	5	1	9.271241-01
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15	5	6	2	9.166601-01
15	5	6	3	9.226096-01
15	5	6	4	9.310724-01
15	5	6	5	9.413472-01

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2. Doppler shift
3. Photons
4. Thermal radiation
5. Velocity

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